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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

U.S.
DEPARTMENT
OF COMMERCE

Patent
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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 24, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,461,043 through 4,462,114
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 10, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,382,302	06/249,171	5/10/83
4,382,315	06/193,133	5/10/83
4,382,318	06/218,812	5/10/83
4,382,324	06/217,047	5/10/83
4,382,337	06/336,921	5/10/83
4,382,340	06/282,387	5/10/83
4,382,343	06/226,398	5/10/83
4,382,345	06/269,484	5/10/83
4,382,358	06/302,614	5/10/83
4,382,359	06/229,015	5/10/83
4,382,363	06/270,893	5/10/83
4,382,391	06/268,840	5/10/83
4,382,400	06/223,587	5/10/83
4,382,404	06/276,712	5/10/83
4,382,411	06/230,185	5/10/83
4,382,416	06/235,115	5/10/83
4,382,417	06/227,172	5/10/83
4,382,418	06/278,039	5/10/83
4,382,424	06/325,477	5/10/83
4,382,428	06/271,680	5/10/83
4,382,434	06/271,838	5/10/83
4,382,437	06/279,854	5/10/83
4,382,439	06/265,974	5/10/83
4,382,440	06/244,904	5/10/83
4,382,443	06/265,093	5/10/83
4,382,449	06/278,652	5/10/83
4,382,459	06/291,189	5/10/83
4,382,465	06/324,023	5/10/83
4,382,475	06/265,334	5/10/83
4,382,478	06/278,077	5/10/83
4,382,481	06/230,978	5/10/83
4,382,482	06/263,372	5/10/83
4,382,518	06/231,562	5/10/83
4,382,520	06/218,539	5/10/83
4,382,529	06/216,569	5/10/83
4,382,535	06/216,006	5/10/83
4,382,537	06/287,459	5/10/83
4,382,539	06/271,392	5/10/83
4,382,543	06/275,331	5/10/83
4,382,554	06/303,367	5/10/83
4,382,567	06/227,380	5/10/83
4,382,572	06/226,622	5/10/83
4,382,577	06/270,865	5/10/83
4,382,587	06/246,032	5/10/83
4,382,588	06/251,768	5/10/83
4,382,600	06/254,323	5/10/83
4,382,601	06/235,527	5/10/83
4,382,609	06/321,502	5/10/83
4,382,613	06/219,265	5/10/83
4,382,616	06/263,567	5/10/83
4,382,624	06/216,099	5/10/83
4,382,633	06/237,623	5/10/83
4,382,634	06/275,084	5/10/83
4,382,663	06/257,409	5/10/83
4,382,664	06/297,328	5/10/83
4,382,714	06/241,403	5/10/83
4,382,722	06/230,419	5/10/83
4,382,724	06/259,290	5/10/83
4,382,726	06/262,651	5/10/83
4,382,731	06/302,838	5/10/83
4,382,737	06/240,788	5/10/83
4,382,744	06/246,462	5/10/83
4,382,746	06/265,546	5/10/83
4,382,757	06/249,954	5/10/83
4,382,759	06/269,410	5/10/83
4,382,763	06/290,225	5/10/83
4,382,793	06/329,264	5/10/83
4,382,801	06/330,745	5/10/83
4,382,814	06/286,931	5/10/83
4,382,815	06/287,349	5/10/83
4,382,816	06/287,442	5/10/83
4,382,833	06/296,227	5/10/83
4,382,841	06/316,075	5/10/83
4,382,852	06/326,454	5/10/83
4,382,853	06/326,464	5/10/83
4,382,857	06/325,318	5/10/83
4,382,875	06/364,009	5/10/83
4,382,899	06/329,676	5/10/83
4,382,901	06/404,065	5/10/83
4,382,944	06/307,838	5/10/83
4,382,947	06/319,767	5/10/83
4,382,948	06/361,653	5/10/83
4,382,973	06/308,709	5/10/83
4,382,998	06/271,479	5/10/83
4,383,002	06/297,393	5/10/83
4,383,004	06/255,263	5/10/83
4,383,014	06/361,151	5/10/83
4,383,021	06/347,510	5/10/83
4,383,059	06/304,645	5/10/83

Patent Number	Serial Number	Issue Date
4,383,061	06/277,453	5/10/83
4,383,127	06/283,148	5/10/83
4,383,139	06/239,346	5/10/83
4,383,140	06/218,652	5/10/83
4,383,141	06/310,636	5/10/83
4,383,145	06/284,406	5/10/83
4,383,148	06/223,808	5/10/83
4,383,186	06/349,464	5/10/83
4,383,202	06/219,002	5/10/83
4,383,204	06/242,779	5/10/83
4,383,247	06/277,447	5/10/83
4,383,286	06/367,009	5/10/83
4,383,307	06/259,998	5/10/83
4,383,313	06/238,575	5/10/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,527,852, Re. S.N. 055,088, Filed May 28, 1987, Cl. 339/97P, MULTIGAUGE INSULATION DISPLACEMENT CONNECTOR AND CONTACTS THEREFOR, Helen Dechelette, Owner of Record: *Inventor,* Attorney or Agent: Louis A. Hecht, Ex. Gp.: 322

4,577,774, Re. S.N. 056,611, Filed June 1, 1987, Cl. 220/66, BUCKLE RESISTANCE FOR METAL CONTAINER CLOSURES, Tuan A. Nguyen, Owner of Record: *Ball Corp., Muncie, Ind.,* Attorney or Agent: Gilbert E. Alberding, Ex. Gp.: 241

4,589,704, Re. S.N. 059,077, Filed June 8, 1987, Cl. 303/6M, AIR BRAKE WITH COLLET LOCKED PUSH ROD AND AIR SUPPLY SYSTEM, John M. Graham, Owner of Record: *Inventor,* Attorney or Agent: Thomas F. Smegal, Jr., et al., Ex. Gp.: 314

4,590,765, Re. S.N. 058,261, Filed June 4, 1987, Cl. 60/585, HYDRAULIC CYLINDER MODULAR STRUCTURE, Keith V. Leigh-Monstevens, Owner of Record: *Automotive Products Plc, Leamington SPA., England,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 341

4,610,582, Re. S.N. 056,784, Filed June 2, 1987, Cl. 409/163, ROLLER HOLD DOWN DEVICE, James R. Amos, et al., Owner of Record: *Stanwich Industries, Inc., Greenwich, Conn.,* Attorney or Agent: James Van Santen, et al., Ex. Gp.: 322

4,617,303, Re. S.N. 059,254, Filed June 3, 1987, Cl. 514/238, 7-AMINOZOLO PYRIMIDINES AND FUNGICIDES CONTAINING THESE, Karl Eicken, et al., Owner of Record: *BASF Aktiengesellschaft, Ludwigshafen, Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 125

4,617,429, Re. S.N. 054,877, Filed May 26, 1987, Cl. 381/68.6, HEARING AID, Gaspare Bellafiore, Owner of Record: *Inventor,* Attorney or Agent: Elliott A. Salter, et al., Ex. Gp.: 261

4,640,287, Re. S.N. 055,252, Filed May 29, 1987, Cl. 128/460, RELEASABLE FASTENING MEANS AND METHOD FOR CLOTHING ITEMS, PARTICULARLY CAPS, BRASSIERS, AND NURSING BRASSIERS, Raymond G. Anderson, et al., Owner of Record: *Inventor,* Attorney or Agent: Edmund J. Sease, et al., Ex. Gp.: 247

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Patent and Trademark Office
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO–87–A6–chemical technology, PTO–87–A7–electrical technology, and PTO–87–A8–mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

Duties: Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

(1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
(2) to declare and to conduct proceedings in interferences; and
(3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

Qualification requirements: In addition to a technical degree, candidates must possess:

(1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
(2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;

(3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
(4) A high degree of demonstrated competence and knowledge of interference law and practice;
(5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
(6) Demonstrated ability to write clearly, and to write logically developed opinions;
(7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
(8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
(9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors which will be considered in evaluating qualified candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

(1) Personal Qualifications Statement, SF–171;
(2) Merit Program Interest Statement, CD–261 (PTO employees only);
(3) Current supervisory appraisal on your agency's form or on CD–362 (letters of reference for outside candidates);
(4) Annual narrative performance rating, or equivalent;
(5) Examiner-in-Chief Questionnaires; and
(6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557–3631.

Feb. 3, 1987.

DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner or Patents and Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Wine Diversions, Ltd., Denver, Colo., Reg. No. 1,214,140, for the mark "THE WINE GAME AND DESIGN", Canc. No. 15,999.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

California Network Systems, Milpitas, Calif., Reg. No. 1,377,037, for the mark "COMCARD", Canc. No. 15,949.

Carlos Cruz, dba Love Girl, West New York, N.J., Reg. No. 1,269,569, for the mark "LOVE GIRL", Canc. No. 16,137.

Washmobile Corp. of New Jersey, Union, N.J., Reg. No. 848,991, for the mark "SPARKY AND DESIGN", Canc. No. 15,943.

North Shore Manufacturing Co., Duluth, Minn., Reg. No. 637,768, for the mark "NORTH SHORE", Canc. No. 16,231.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for June 1987:

Service Item	FY 1987 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	35
Trademarks	30	49
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	1
Mail Coupons	12	4
Letter Orders	16	11
Certified Copies:		
Trademark Registrations	21	31
Applications-As-Filed	17	15**
File-Wrapper/Contents	N/A	33
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	42
Filing Reg. Certificates	Issue Date	Issue Date
Assignments:		
Patents	20	30
Trademarks	20	30
Receipt Date of Trademark Documents Returned		Apr. 30, 1987***
Receipt Date of Patent Documents Returned		May 28, 1987
Avg. Days from Issue Fee Payment to Issue Date	90–100	92
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	94% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.
** The 5% of orders for which fiche are not on site are not included in calculations.
*** For efficiency of microfilm processing, trademark assignments are batched by month for recordation. Documents are returned after quality review of the month's batch of microfilm. Also see Improvements to Services.

IMPROVEMENTS TO SERVICES

Until recently, trademark assignments containing more than 99 properties were pulled from the normal processing pipeline and handled separately. This was being done since the automatic typewriters used to record the information must be reset to accommodate for more than 99 properties. However, this procedure has resulted in delays in recording such assignments, and in their being processed well after other assignments with earlier receipt dates. This backlog is now being addressed and will be processed by the end of July. All trademark assignments, regardless of the number of properties, are now being processed in date order.

HELPFUL HINTS

- *Correspondence with Certificate of Mailing Delivered by Commercial Carrier* — The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand-carried or delivered to the PTO via commercial mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS'," etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than the U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

July 6, 1987.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of July 28, 1987

Re. 32,359	4,626,331	4,646,509	4,656,904
4,111,727	4,626,904	4,646,791	4,656,959
4,348,218	4,627,436	4,646,829	4,657,179
4,382,197	4,627,707	4,647,116	4,657,420
4,434,790	4,628,938	4,647,803	4,657,481
4,451,574	4,628,951	4,648,063	4,657,989
4,501,206	4,631,262	4,648,087	4,658,024
4,543,324	4,631,530	4,648,261	4,658,053
4,553,597	4,632,066	4,649,628	4,658,256
4,565,456	4,632,583	4,650,132	4,658,737
4,565,686	4,632,811	4,650,483	4,659,044
4,578,393	4,632,965	4,650,752	4,659,200
4,592,439	4,633,200	4,651,319	4,659,202
4,593,196	4,633,212	4,651,596	4,659,228
4,596,407	4,633,269	4,651,652	4,659,473
4,598,131	4,633,567	4,651,805	4,659,526
4,598,775	4,633,791	4,651,824	4,659,818
4,602,658	4,635,310	4,651,859	4,659,915
4,606,082	4,636,474	4,652,219	4,660,251
4,606,807	4,639,671	4,652,333	4,660,424
4,610,399	4,639,962	4,652,398	4,661,263
4,613,695	4,640,542	4,652,939	4,661,284
4,615,383	4,641,391	4,653,061	4,661,328
4,615,680	4,642,064	4,653,546	4,661,724
4,616,470	4,642,848	4,653,667	4,662,425
4,616,540	4,643,141	4,653,851	4,662,557
4,619,481	4,643,369	4,654,025	4,662,672
4,622,963	4,643,444	4,654,080	4,662,676
4,623,432	4,644,318	4,654,129	4,662,735
4,623,697	4,646,079	4,654,244	4,663,030
4,624,317	4,646,118	4,654,886	4,664,346
4,624,555	4,646,281	4,655,782	4,664,575
4,624,841	4,646,335	4,655,952	

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	Springfield: Illinois State Library	(217) 782-5430
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 20, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-06-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	4-18-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	6-13-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-10-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-14-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-25-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-29-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during June 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,514,784 to 3,518,700, inclusive

Plant Patents ..... Numbers 2,970 to 2,976 inclusive

REEXAMINATIONS

JULY 28, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,351,753 (733rd)

LIQUIFIED NORMALLY SOLID POLYOXYALKYLENE BLOCK COPOLYMERS

Thomas M. Kaneko, Trenton, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Reexamination Request No. 90/001,112, Oct. 6, 1986.
Reexamination Certificate for Patent No. 4,351,753, issued Sep. 28, 1982, Ser. No. 200,118, Oct. 24, 1980.
Int. Cl.[4] B01F *17/00;* **C08K** *5/05;* **C07C** *43/11;* **C08L** *63/00*
U.S. Cl. 252—357

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **10–18** is confirmed.

Claim **1** is cancelled.

Claim **2** is determined to be patentable as amended.

Claims **3–9**, dependent on an amended claim, are determined to be patentable.

New claims **19** and **20** are added and determined to be patentable.

2. A *liquid* composition of matter consisting essentially of from about 15 to 90 percent by weight of a *normally solid* nonionic polyoxyalkylene block copolymer, 15 to 80 percent by weight ethylene glycol and 0 to 30 percent by weight water.

B1 4,423,244 (734th)

PROCESS FOR THE PREPARATION OF THE D-2-(6-METHOXY-2-NAPHTHYL)-PROPIONIC ACID

Vincenzo Cannata, Borgo Nuovo di Pontecchio Marconi, and Giancarlo Tamerlani, Pontecchio Marconi, both of Italy, assignors to Alfa Chemicals Italiana S.p.A., Milan, Italy

Reexamination Request No. 90/001,017, May 30, 1986.
Reexamination Certificate for Patent No. 4,423,244, issued Dec. 27, 1983, Ser. No. 362,679, Mar. 29, 1982.
Claims priority, application Italy, Apr. 1, 1981, 3385 A/81
Int. Cl.[4] C07C *65/105*
U.S. Cl. 562—466

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

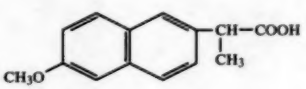
The patentability of claims **11, 12, 13** and **14** is confirmed.

Claim **2** and **4** are cancelled.

Claim **1** is determined to be patentable as amended.

Claims **3, 5–10** and **13**, dependent on an amended claim, are determined to be patentable.

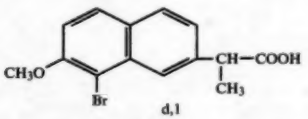
1. A process for preparing the d-2-(6-methoxy-2-naphthyl)-propionic acid of formula I



(I)

d

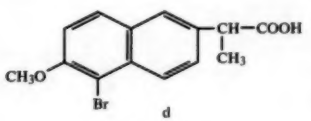
which consists of (1) reacting a mixture of d- and l-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acids of formula II



(II)

d,l

with N-methyl-D-glucamine in a solvent system selected from mixtures of toluene and methanol [in various volumetric ratios.] *wherein the mixture of tolune and methanol in said step (1) is a 4/1 or 3/1 (v/v) mixture,* in the presence of an optically inactive organic or inorganic base, at a temperature between about room temperature and about 65° C., whereby the N-methyl-D-glucamine salts of the d- and l-isomers of said compound of formula II are formed, letting the less soluble N-methyl-D-glucamine salt of the d-isomer precipitate, separating said salt from the reaction mixture, (2) reacting said salt with a strong mineral acid, whereby the compound d-2-(5-bromo-6-methoxy-2-naphthyl)-propionic acid of formula III



(III)

d

is obtained, and (3) catalytically hydrogenating said compound of formula III in an alkaline medium at a temperature between about room temperature and about 100° C. for a period of time varying from 1 to about 4 hours, whereby the bromine atom in the 5-position is replaced by hydrogen and isolating said compound of formula I from the reaction mixture.

REISSUES

JULY 28, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,463

METHOD OF AND APPARATUS FOR TELEMETERING INFORMATION FROM A POINT IN A WELL BOREHOLE TO THE EARTH'S SURFACE

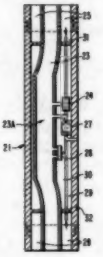
John H. Westlake, Calgary; Clifford H. Leach, Penticton, and Clifford L. Ainsworth, Calgary, all of Canada, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Original No. 4,078,620, dated Mar. 14, 1978, Ser. No. 664,745, Mar. 8, 1976. Application for reissue Nov. 6, 1979, Ser. No. 92,087

Claims priority, application United Kingdom, Mar. 10, 1975, 09787/75

Int. Cl.[4] E21C *7/06*

U.S. Cl. 175—48 **2 Claims**



25. A method of telemetering information from a point in a well borehole to the earth'surface by utilizing a drill string extending into the borehole, and thereby defining a borehole annulus, a drill bit on one end of the drill string having at least one restrictive nozzle therein, a drilling fluid pump connected to the other end of the drill string, an assembly connected in the drill string and having an unobstructed passage therethrough, a bypass passageway in the assembly directly communicating the unobstructed passage to the borehole annulus and a motorized valve in said bypass passageway, the method comprising the steps of continuously pumping drilling fluid under pressure through the drill string, through the unobstructed flow passage and out through the drill bit nozzle, detecting at a point in the borehole the information to be telemetered, translating and transmitting said information into digital signals, using said digital signals in operating said valve to plurally decrease and increase the fluid pressure in the drilling string by plurally opening and closing the valve in the bypass passageway in a coded decimal format thereby venting a portion of the drilling fluid directly into the borehole annulus and bypassing the drill bit nozzle with said portion of fluid while maintaining continuous unobstructed drilling fluid flow through the assembly and continuous flow through the drill bit nozzle, detecting the decreases and increases in the drilling fluid pressure while continuously circulating the drilling fluid and decoding and displaying at the surface the results of the decreases and increases in drilling fluid pump pressure.

26. In a well drilling system which includes a hollow drill string within a borehole thereby defining a borehole annulus, a drill bit on one end of said hollow drill string, at least one drilling fluid restrictive nozzle in said bit, a drilling fluid circulation system including a surface pump and a source of drilling fluid, and conduit means operatively connecting said pump to said source of drilling fluid and to the other end of said hollow drill string; the improvement comprising in combination, a down-hole assembly having means connecting the assembly in the drill string, a continuous unobstructed passage through said assembly in communication with said drill string, a bypass passageway in said assembly directly communicating the unobstructed passage in the assembly to the borehole annulus and bypassing said drill bit nozzle, a motorized valve in the bypass passageway for controlling fluid flow directly to the associated borehole annulus when the valve is open and to shut off said last mentioned flow when said valve is closed, at least one information responsive transducer operatively connected to said assembly, means in said assembly to translate information received by said transducer into means to plurally open and close said valve in a coded decimal sequence thereby plurally decreasing and increasing the drilling fluid pressure in said sequence, means remote from said assembly to detect said decreases and increases in drilling fluid pressure, means operatively connected to said detecting means to decode said detected decreases and increases in drilling fluid pressure and means at the surface to display the decoded information.

Re. 32,464

THIN FILM RECORDING AND METHOD OF MAKING

Harry E. Aine, 30600 Page Mill Rd., Los Altos, Calif. 94022

Original No. 4,411,963, dated Oct. 25, 1983, Ser. No. 280,844, Jul. 6, 1981. Continuation of Ser. No. 691,285, Jan. 4, 1985, abandoned, which is a division of Ser. No. 280,844, Jul. 6, 1981, Pat. No. 4,411,963, which is a division of Ser. No. 736,814, Oct. 29, 1976, Pat. No. 4,277,540, which is a continuation-in-part of Ser. No. 139,887, May 3, 1971, Pat. No.

Int. Cl.[4] B21D *39/00*

U.S. Cl. 428—622 **29 Claims**

23. In a method for protecting a magnetic recording disc of the type having a disc-shaped substrate coated with a continuous, non-particulate film of magnetic recording medium, the steps of:

exciting a gaseous atmosphere at subatmospheric pressure with an electrical discharge;

sputtering carbon within said excited gaseous atmosphere at subatmospheric pressure; and

depositing a film of the sputtered carbon onto the coated substrate and tightly adhering the sputtered carbon film to the coated substrate in overlaying relationship with the film of magnetic recording medium to form a tightly adherent wear-resistant carbon film on the coated substrate for causing the magnetic recording disc to be wear-resistant.

Re. 32,465

AZA PENEM COMPOUNDS

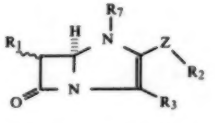
Adriano Afonso, Essex County, and Frank Hon, Bergen County, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Original No. 4,431,658, dated Feb. 14, 1984, Ser. No. 387,726, Jun. 11, 1982. Division of Ser. No. 230,774, Feb. 2, 1981, Pat. No. 4,347,183. Application for reissue May 29, 1985, Ser. No. 738,702

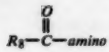
Int. Cl.[4] C07D *487/04;* **A61K** *31/415*

U.S. Cl. 514—210 **3 Claims**

1. A compound having the following structural formula:



wherein R_1 is [hydrogen;] lower alkyl; [R_8-C-amino]



wherein R_8 is lower alkyl, lower alkyl substituted by one or more of one or two ring carbocyclic aromatic groups, lower alkoxy, phenyloxy, alkenyl of 2 to 6 carbon atoms, alkynyl of 2–6 carbon atoms, cycloalkyl of 4–6 carbon atoms, unsubstituted or substituted heteroaryl *selected from pyridyl, furanyl, thienyl, isoxazolyl, quinoxalinyl, isothiazolyl, imidazolyl, indolyl, triazolyl, thiadiazolyl and tetrazolyl* or heteroaryllowerallkyl wherein the heteroaryl [contains one or two hetero atoms selected from oxygen, nitrogen or sulfur] *group is as defined above* and wherein the substituents in the heteroaryl *group* are from 1 to 3 lower alkyl groups, wherein said R_8 substituents are optionally substituted by hydroxy, thiol, loweralkylthio, lower alkyl, lower alkoxy, halogen, cyano, carboxy, nitro, amino, aminoloweralkyl or halololoweralkyl; or

wherein R_4 is hydrogen, lower alkyl, phenyl substituted by lower alkyl, lower alkoxy or halogen, [heteroaryl wherein the heterocyclic ring is an aromatic heterocyclic containing a hetero atom selected from sulfur, oxygen or nitrogen,] *pyridyl, furanyl or thienyl,* and R_5 is hydrogen or an O-protecting group;

R_2 is lower alkyl, phenyl substituted by lower alkyl, lower alkoxy or halogen, alkylaryl, aminoloweralkyl, an N-protected amino-lower alkyl, hydroxy lower alkyl, an O-protected hydroxyloweralkyl, thio lower alkyl, an α-amino acid ester, an α-(N-protected) amino acid ester or a lower alkyl carboxylic acid ester;

R_3 is nitrile, tetrazole, or —$COOR_6$ wherein R_6 is lower alkyl, loweralkyltrihalogenomethyl, phenyl substituted by lower alkyl, lower alkoxy or halogen, allyl, a metabolisable ester, hydrogen, or an alkali metal cation;

Z is sulfur, oxygen[,—$(CH_2)_n$— wherein n is 1 or 2,] or NR_7 wherein R_7 is hydrogen, lower alkyl, phenyl substituted by lower alkyl, lower alkoxy or halogen,

wherein [R8] R_8 is as defined above, or an N-protecting group;

and the pharmaceutically acceptable salts thereof.

Re. 32,466

HEAT-SENSITIVE COLOR-FORMING RECORDING MATERIAL AND PROCESS FOR PREPARATION THEREOF

Nobuhiro Miyakawa, Esaka, Japan, assignor to Mita Industrial Co Ltd., Osaka, Japan

Original No. 4,459,336, dated Jul. 10, 1984, Ser. No. 506,227, Jun. 23, 1983. Division of Ser. No. 346,772, Feb. 8, 1982, abandoned. Application for reissue Jun. 30, 1986, Ser. No. 880,431

Claims priority, application Japan, Feb. 9, 1981, 56-16820; Feb. 9, 1981, 56-16821

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—208 **6 Claims**

1. A heat-sensitive color-forming recording material which comprises a recording layer comprising a particulate phenolic color developer and a particulate leuco pigment, which are dispersed in a binder independently from each other, wherein the phenolic color developer and/or leuco pigment is present in the form of compatible solid particles with a substantially inactive organic solid medium selected from the group consisting of sterically hindered phenol compounds, said organic solid medium having a melting or softening point lower than that of the phenolic color developer and/or leuco pigment and said organic solid medium is present in said compatible solid particles in an amount [2 to 250 times as large as] *of 0.2 to 250% by weight, based on* the amount of the phenolic color developer and/or leuco pigment on the weight base.

PATENTS

GRANTED JUL. 28, 1987

ERRATA

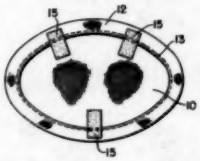
For CLASS	See PATENT NO.
053-298	4,682,463
439-092	4,682,828
439-083	4,682,829
439-224	4,682,830
439-294	4,682,831
439-589	4,682,832
439-377	4,682,833
439-267	4,682,834
439-395	4,682,835
439-426	4,682,836
439-344	4,682,837
439-598	4,682,838
439-598	4,682,839
439-874	4,682,840
358-260	4,682,869
380-054	4,682,954
260-513	4,683,100
261-146	4,683,101
523-412	4,683,273
525-329	4,683,286
379-396	4,683,351
328-133	4,683,437
323-288	4,683,438
324-249	4,683,535

PATENTS

GRANTED JULY 28, 1987

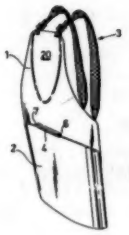
GENERAL AND MECHANICAL

4,682,371
PROTECTIVE EYE PATCH
Carolyn R. Heltman, 84 Gallows Hill Rd., West Redding, Conn. 06896
Filed Oct. 6, 1986, Ser. No. 916,742
Int. Cl.[4] A61F *9/00, 13/12*
U.S. Cl. 2—15 **6 Claims**



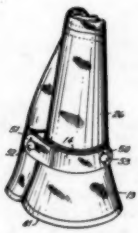
1. An aesthetically and medically improved eye patch of the character shown and described which comprises, an enclosing substantially rigid continuous frame member of lightweight material such as aluminum or plastic, said frame member defining a central opening and having a pair of opposed substantially planar front and back faces and connecting inner and outer edges, fabric-like covering material securely mounted on said frame member and having an inwardly extending portion secured in position on one planar face of said frame member as a sole closing-off means for the central opening, relatively short length adhesive tabs having one adhesive side adapted to be secured in a substantially balanced spaced-apart relation on said covering material to extend substantially diagonally inwardly from the back planar face of said frame along a back face of the covering material, said tabs projecting only inwardly towards the central opening of said frame and having an opposite adhesive side to mount and adhesively secure the patch in alignment with and about surrounding bone structure of a wearer that defines his or her eye socket in such a manner that the frame member will extend in a substantially horizontal shape-conforming relation about the eye socket of the wearer, that the covering material will have and retain a desired relation with respect to the eyelid of the wearer, and that said adhesive tabs will be invisible from the outside of the patch in its mounted relation.

4,682,372
PROTECTIVE APRON
Lars-Eric Peterson, Roslagsgatan 50-52C, S-113 53 Stockholm, and Jan Söderlind, Smålandsgatan 41, S-186 00 Vallentuna, both of Sweden
Filed Dec. 15, 1986, Ser. No. 942,085
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—51 **4 Claims**



1. A chest, belly and crutch protective apron comprising an upper and a lower panel consisting of a puncture-resistant material, said panels being curved to conform with the wearer's body, said upper and lower segments being arranged one above the other in a substantially overlapping relationship by hinge means, wherein said hinge means comprises an elongate indentation provided in the upper panel and extending transversely to the longitudinal axis of the apron, lug means which are provided at the upper portion of the lower panel and spaced apart a distance corresponding to the distance between generally flat end walls delimiting the extension of said indentation in said transverse direction and pivot pin means extending through openings provided in said end walls and said lugs, so as to pivotally connect said upper and lower panels to each other, and harness means to support said apron on the wearer.

4,682,373
COLLAPSIBLE HAT CONSTRUCTION
Abram Baran, 568 Broadway, New York, N.Y. 10013
Filed Aug. 23, 1982, Ser. No. 410,606
Int. Cl.[4] A42B *1/20*
U.S. Cl. 2—175 **2 Claims**



1. In a collapsible hat including a crown element, a brim element, and a band element interconnecting said crown and brim elements, the improvement comprising: said band element having at least two snap fastener components mounted on an outer surface thereof in spaced relation, an auxiliary strap member having first and second ends, said first end having means for attachment to said outer surface of said band element, said second end having a corresponding snap fastener component selectively engageable with each of said above mentioned snap fastener components, whereby: said hat in erected condition may support said strap in overlying relation relative to the said outer surface of said band element by engagement with one of said snap fastener components on said band element; said hat being collapsed by first folding said crown, band and brim elements to curvilinear planar condition, and subsequently winding the same to furled condition, in which condition said strap element is engaged with the other of said snap fastener components to maintain said furled condition.

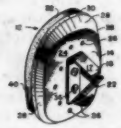
4,682,374
PROTECTIVE EAR COVERING
Joseph Geiser, P.O. Box J, Pocono Lake, Pa. 18347
Filed Mar. 5, 1986, Ser. No. 838,479
Int. Cl.[4] A41D *21/00*
U.S. Cl. 2—209 **6 Claims**

1. A protective ear covering intended to be worn as a pair in combination with the goggle strap of conventional ski goggles, said ear protector comprising:

(a) a case sized to overfit a wearer's ear, said case being generally elliptical in longitudinal cross section and in-

cluding a hollow inner portion to overfit a wearer's ear, said case including a wedge-shaped riser and a flattened top, said top thereby forming generally an inclined plane with said riser to cause said case portion touching the user's head behind the ear to rise to accommodate the ear'outward projection;

(b) a deformable gasket circumscribing said case's inner edge and extending outward therefrom;



(c) at least one vent extending through said case to provide ventilation and to allow sound to penetrate; and,

(d) a self-fastening, adjustable attachment strap, said attachment strap sized to at least surround the width of said goggle strap and attached to said case top exterior proximate its midpoint.

4,682,375

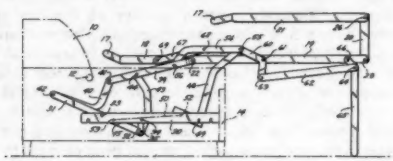
SOFA-BED ASSEMBLY

L. Robert Pokorny, Wading River, N.Y., assignor to Louis Pokorny Company, Inc., Ronkonkoma, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,218

Int. Cl.[4] A47C *17/00, 17/04*

U.S. Cl. 5—13 **6 Claims**



1. In a sofa-bed assembly having a stationary bracket with respect to a sofa body and a series of sections pivoted to one another in succession, the sections being foldable between a collapsed sofa condition and an extended bed condition, and the sections including an upper horizontal section having an upper surface defining the seating level of the sofa when the sections are in collapsed condition,

a supporting linkage pivotally connecting the sections to the bracket for constraining the sections to fold and unfold in acccordance with a predetermined pattern of movement, the supporting linkage including:

a control link pivotally connected directly to one of the sections, and

two pivot links, each pivot link being directly pivotable about an axis fixed with respect to the stationary bracket and each pivot link being pivotally connected directly to the control link,

the supporting linkage being located in its entirety below the plane containing the upper surface of the upper horizontal section when the sections are in their collapsed condition.

4,682,376

DELIVERY BED

Mats Feldt, Listorp, Sweden, assignor to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden

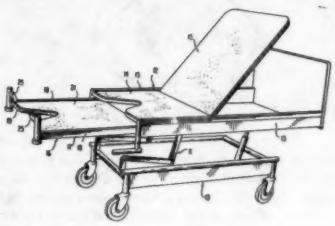
Division of Ser. No. 786,284, Oct. 10, 1985, Pat. No. 4,615,058. This application Aug. 6, 1986, Ser. No. 893,684

Claims priority, application Sweden, Oct. 10, 1985, 8500388

The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.

Int. Cl.[4] A61G *7/00*

U.S. Cl. 5—60 **1 Claim**



1. A delivery bed having a raisable and lowerable overlying bed structure and side-pieces for supporting a seat part and a raisable back-rest, and further including a frame structure which can be slidably moved lengthwise of the bed relative to the seat part and which incorporates an elongated plate-like element intended to form a leg-support capable of being extended from an inwardly inserted position to a plurality of extended positions, said frame having mounted thereon a support roller rotatable about a horizontal axis perpendicular to the length of the bed, and means on said frame structure defining a plurality of downwardly opening recesses, said recesses being spaced apart in a direction lengthwise of the bed and being selectively individually engageable over said roller in said plurality of extended positions thereby to support said frame structure in a selected one of said positions against sliding movement lengthwise of said frame, said frame structure being raisable and lowerable relative to said roller to an extent such that when raised, the frame structure can slide lengthwise of the bed with said roller out of engagement with all of said recesses, and when lowered can roll on said roller until said roller enters one of said recesses.

4,682,377

DEVICE FOR TRANSFERRING IMMOBILE PERSONS

Peter S. Reich, Brooklyn, N.Y., assignor to Design Mobility, Inc., Brooklyn, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,256

Int. Cl.[4] A61G *7/08, 7/10*

U.S. Cl. 5—86 **5 Claims**

1. A device for lifting and lowering invalid patients and for transferring them from one location to another comprising:

a base supported on roller means so as to be readily movable from one location to another;

an upright member mounted on and extending upwardly from said base;

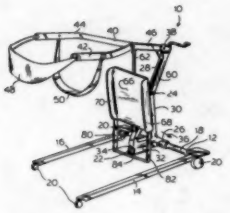
a lever arm connected at one end adjacent the upper portion of the upright member by means of a horizontal pivot so as to be rotatably shiftable in a vertical plane only and terminating at its outer end in a pair of horizontally spaced end portions, said end portions normally being spaced outwardly from the upright member in a generally horizontal direction;

means for attaching a sling between the said end portions by

engagement around the back of a patient at a location beneath his armpits;

lifting and lowering mechanism associated with the said upright member;

a drive rod having pivotal connection at its upper end to the lever arm at a point intermediate the length thereof and extending downwardly therefrom into connection with the lifting and lowering mechanism; and



a knee and leg engaging plate member mounted on the drive rod intermediate the length thereof in facing relation to the end portions of the lever arm

whereby when a sling attached to said end portions is engaged around the back of a seated patient at a point beneath the level of his armpits and the lifting and lowering mechanism is actuated to lift the patient, the patient is moved above seated position and is held against rotation so that he can be transferred from one location to another.

4,682,378

BODY SUPPORT, SUCH AS A MATTRESS

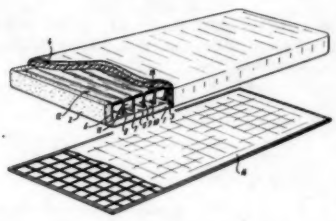
Franciscus G. Savenije, Schalkhaar, Netherlands, assignor to Auping b.v., Netherlands

Continuation-in-part of Ser. No. 634,026, Jul. 24, 1984, abandoned. This application Feb. 26, 1985, Ser. No. 705,694

Claims priority, application Netherlands, Aug. 2, 1983, 8302733

Int. Cl.[4] A47C *23/08, 27/00*

U.S. Cl. 5—239 **18 Claims**



1. A body support device having a primary axis parallel to the direction of a center line of a human body which the support device is adapted to support comprising:

a plurality of interconnected tubular chambers adapted to be filled with a fluid medium arranged parallel to one another and perpendicular to the primary axis; and

means for controlling deflection of a body in contact with an upper surface of the support device in accordance with the volume-to-weight ratios of the various parts of the human body which the body support device is adapted to support, said deflection-controlling means comprising separate elongated members of varying deflectability located at the upper surfaces of said tubular chambers, each member arranged parallel to the longitudinal axis of the tubular chamber with which it is associated, said elongated members formed from an elastic material, the modulus of elasticity of some of said elongated members differing from that of other elongated members.

4,682,379

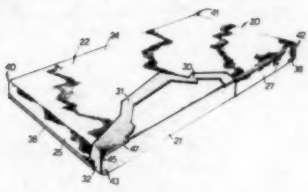
MATTRESS PAD AND FITTED BED SHEET

Jeffrey S. Dugan, Matthews, N.C., assignor to Springs Industries, Inc., Fort Mill, S.C.

Filed Dec. 4, 1985, Ser. No. 805,319

Int. Cl.[4] A47G *9/02*

U.S. Cl. 5—500 **15 Claims**



1. A fitted bed sheet and mattress pad combination comprising:

a bed sheet with an approximately rectangular top ply for mounting in overlying arrangement over one surface of an approximately rectangular mattress, and foot, head and opposite side skirts extending from the foot, head and opposite side edge portions of said top ply for fitting about the foot, head and side surfaces of the mattress, said skirts each including a lower edge portion,

a mattress pad in underlying relationship with respect to the top ply of said bed sheet, said mattress pad being of a width approximately the same as the width of the top ply of said bed sheet and of a length longer than the length of the top ply of said bed sheet, the foot and head portions of said mattress pad extending beyond the top ply of said bed sheet into underlying relationship with the foot and head skirts of said bed sheet for fitting about the foot and head surfaces of the mattress, said foot and head portions of said mattress pad each including a lower edge portion substantially aligned with the lower edge portions of the foot and head skirts of said bed sheet, respectively,

first connecting means extending along each side edge portion of the mattress pad and holding said bed sheet and said mattress pad together along the opposite side edge portions of said mattress pad and along the opposite side edge portions of the top ply of said bed sheet, and

second connecting means holding the foot and head portions of said mattress pad to the foot and head skirts of said bed sheet respectively along their aligned lower edge portions.

4,682,380

BOX FOR BEEKEEPING FOR THE CREATION OF A BEE COLONY, CHANGE OF QUEEN FROM A HIVE IN ACTIVITY AND PARTIAL RESTRICTION OF BROOD REARING

Alain Martin, 25 boulevard de l'Europe, 69600 Oullins, France

Filed Jan. 13, 1986, Ser. No. 818,118

Claims priority, application France, Jan. 14, 1985, 85 00616

Int. Cl.[4] A01K *49/00*

U.S. Cl. 6—9 **10 Claims**

1. A box for beekeeping, for creating a small colony of bees, for changing a queen bee from one hive in activity and for partially restricting brood rearing or laying, wherein said box is a parallelpipedic enclosure adapted to be fitted into a superhive, or into an upper honey chamber, or into a hive body as a substitute for frames normally disposed in said body or said superhive, said box comprising:

at least four walls;

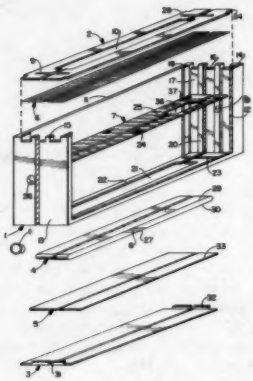
a fixed bottom;

a removable cover, said fixed bottom and removable cover

each comprising an opening whose dimensions are such that they allow at least the passage of the queen and, if necessary, the mixing in less than twelve hours of the bee colony formed or introduced into said box with a second colony;

at least two slots disposed on each side of said opening, said slots being located adjacent or against two opposite walls of said at least four walls and having a length greater than a width of said opening;

a plurality of parallel, vertical frames fitted into said enclosure and being spaced apart from one another and from said fixed bottom by a distance sufficient to permit the bees and the queen to circulate;



at least one entrance on at least one of said at least four walls, said entrance being obturated when the box is placed in position in the hive and said entrance being located opposite the free space between two frames disposed in said box;

netting whose mesh is less than three millimeters, said netting being adapted to be disposed between the cover and a top portion of the frames disposed inside the box and whose dimensions correspond to interior dimensions of said box; and

a removable flap for obturating said opening and said slots in the bottom of said box.

4,682,381

SPIKE FORMING METHOD

Chalmer Jordan, Saegertown; Lee Connor, and Robert Lybarger, both of Meadville, all of Pa., assignors to Saegertown Manufacturing Corporation, Saegertown, Pa.

Filed Jan. 31, 1986, Ser. No. 824,502

Int. Cl.[4] B21K *1/44*; B21G *3/00*

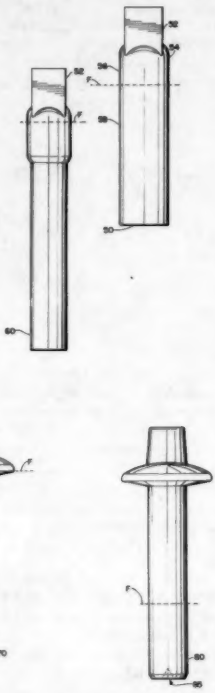
U.S. Cl. 10—63 **15 Claims**

1. A method for forming a cylindrical workpiece having a first diameter into a blank spike which is subsequently provided with threads, said method comprising the steps of:

introducing the workpiece into a first die and forming in said first die a first stage spike having a cylindrical shank and a tool receiving end, said shank having upper and lower portions of said first diameter;

introducing the first stage spike into a second die and forming a second stage spike in said second die by reducing the lower portion of the shank of the first stage spike to a second diameter less than the first diameter of the upper portion of the shank while maintaining said upper shank portion unworked during said second die forming step; and

introducing the second stage spike into a third die and forming a third stage spike in said third die by compressing the upper portion of the shank of the second stage spike to



form a collar between said tool receiving end and said lower portion of said shank.

4,682,382

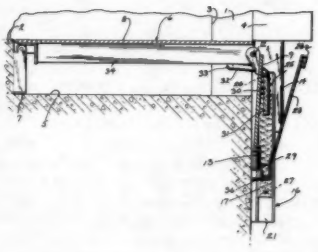
WEATHER SEAL FOR A LOADING DOCK PIT

Mark A. Bennett, Milwaukee, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Jan. 6, 1986, Ser. No. 816,348

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—71.3 **16 Claims**



1. A weather seal associated with a dockboard mounted in a pit of a loading dock, said dock having a front vertical face disposed beneath said pit, said dockboard including a ramp having a rear end hinged to said dock and also including a lip hinged to the forward end of said ramp and movable between a downwardly hanging pendant position and an extended

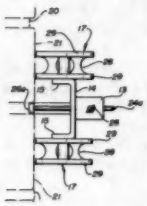
position, said weather seal comprising guide means disposed on the front face of the loading dock, a frame mounted for vertical movement in said guide means, biasing means connected to said frame for biasing the frame to an upper position, a substantially rigid self-supporting panel connected to the frame for flexing movement in a direction toward and away from said dock face and having a portion disposed to be engaged by the bed of a vehicle as the vehicle backs toward the loading dock, and actuating means operably connected to the frame and disposed to be engaged by the dockboard for moving the frame and panel downwardly against the force of said biasing means, said panel providing a seal for the pit.

4,682,383

COMBINATION JOINT RAKER AND JOINTER

Michael Brenish, 317 Edmund Ave., Paterson, N.J. 07502, and Frank Herzig, 64 Douglas Dr., Towaco, N.J. 07082

Filed Apr. 7, 1986, Ser. No. 848,579
Int. Cl.[4] E04F *21/17*
U.S. Cl. 15—105.5 **12 Claims**



1. A combination joint rake and jointer tool for raking and smoothing mortar in the joints of brickwork, said tool for removing excess mortar and for smoothing the remaining mortar comprising:

an elongated tool body having a medial portion forming a handle therefor;

sled bar means for smoothing mortar attached at both ends of said handle, said sled bar means having curved end portions extending from the handle and a runner portion therebetween; and

a rake and carriage assembly attached at one end of said elongated tool body comprising, in turn:

a rake and carriage support attached to one end of said elongated tool body;

a pair of wheels attached to said support with one of said pair on each side of the support for supporting the tool body and sled bar means during travel across the face of said brickwork;

an adjustable rake attached to and extending from said support being adjustable to a predetermined depth in said joints; and,

attachment means for securing said adjustable rake to said support;

whereby upon application, said tool simultaneously rakes the joint with said adjustable rake and smooths said joint with said runner in a single movement of the tool along the joint between two courses of brick.

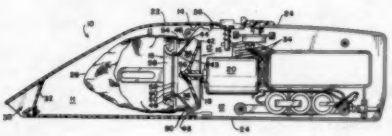
4,682,384

VACUUM GENERATING SYSTEM FOR HAND-HELD VACUUM CLEANER

Joseph M. Prahl and Werner W. Kochte, both of East Cleveland, Ohio, assignor to The Scott & Fetzer Company, Twinsburg, Ohio

Filed Oct. 5, 1983, Ser. No. 539,103
Int. Cl.[4] A47L *5/24*
U.S. Cl. 15—344 **13 Claims**

1. In a hand-held vacuum cleaner, a vacuum generating system comprising fan housing means dividing said cleaner into a vacuum side and a pressure side, a fan mounted in said fan housing means, the front of said fan communicating with said vacuum side, the rear of said fan communicating with said pressure side, said fan having backwardly curved arcuate blades that extend from an inner imaginary circle at their radially innermost extremities outwardly to an outer imaginary circle at their radially outermost extremities, each blade having an axis or axes of curvature that is or are parallel to the central axis of the fan, said axes of curvature being spaced from their corresponding blades a distance or distances greater than the radial distance between said inner and outer imaginary circles and less than the radius of said outer imaginary circle, each of said blades intersecting at its opposite side edges respectively with (1) a rear shroud that includes an annular sloping wall portion that is relatively shallowly angled rearwardly as it extends radially outwardly from said inner imaginary circle to an outer edge that is radially inward of said outer imaginary circle and (2) a front shroud that includes an annular sloping wall portion that is relatively more sharply angled rearwardly as it extends radially outwardly from a location radially outward of said inner imaginary circle to an outer edge that is



coincident with said outer imaginary circle, annularly continuous portions of said fan housing means being positioned in closely spaced facing relation with corresponding portions of said front shroud including a substantial part of said sloping wall portion to provide slip seal means, the rearward end of said slip seal means being radially outward of its forward end such that it provides a centrifugal pumping action to counteract air leakage around the fan from the pressure side to the vacuum side, central spinner means faired into said annular sloping wall portion of said rear shroud, venturi throat means faired into the radially inner portion of said annular sloping wall portion of said front shroud so as to avoid abrupt angular changes in the surfaces encountered by air flowing into the fan, an upstream portion of the venturi throat means being stationary and separated from rotating structure associated with said fan by a circular gap, said upstream portion and associated rotating structure being of generally the same inside diameter adjacent said gap and smoothly increasing in diameter axially forwardly and axially rearwardly respectively, of said gap, said gap being served by said slip seal means which counteracts the tendency for air to leak from the pressure side of the fan back around the fan and through said gap.

4,682,385

METHOD AND APPARATUS FOR AUTOMATICALLY SUSPENDING SAUSAGES FROM A BAR

Minoru Kusai, Kanagawa; Takao Oka; Munenori Takamagari, both of Hiroshima; Chiyoji Shibata, Kanagawa, and Minoru Nakamura, Tokyo, all of Japan, assignors to Fukutome Meat Packers, Ltd., Hiroshima and Hitec Co., Ltd., Tokyo, both of, Japan

Filed Oct. 25, 1985, Ser. No. 791,348
Claims priority, application Japan, Oct. 25, 1984, 59-161936[U]; May 30, 1985, 60-117423
Int. Cl.[4] A22C *15/00*
U.S. Cl. 17—45 **21 Claims**

1. A method of suspending a chain of linked sausages in loops from a bar or smoke stick, said bar having a rearward portion and a forward portion comprising the steps of:

continuously discharging the chain of linked sausages while forming the chain into loops of sausages at a particular location;

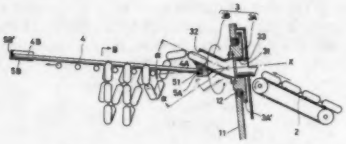
positioning said bar on support members adjacent to said location with said bar being stationary at least in its axial direction from said rearward to said forward portion;

suspending said loops of sausages at said rearward portion of said bar, the rearward portion of said bar being situated inside the loops;

applying a pushing force to each loop for successively moving each loop suspended from the bar toward the forward portion of the bar while maintaining a spacing between mutually adjacent one's of the loops; and

removing said bar from said support members with said loops suspended therefrom after finishing said suspension of sausages.

20. An apparatus for suspending a chain of linked sausages in loops from a bar or smoke stick, said bar having a rearward portion and a forward portion, comprising:



loop forming means for receiving said chain of linked sausages and for forming said chain of sausages into loops, said chain of sausages being suspended by said loop forming means in successive loops from the rearward portion of the bar;

bar supporting means for detachably supporting said bar to be stationary at least in the axial direction from said rearward to said forward portion and having a support portion for supporting said bar with the rearward portion of the bar disposed inside the loops into which said chain of sausages is formed; and

transfer means for successively moving each loop suspended from said bar toward the forward portion of the bar while maintaining a spacing between mutually adjacent ones of said loops.

4,682,386

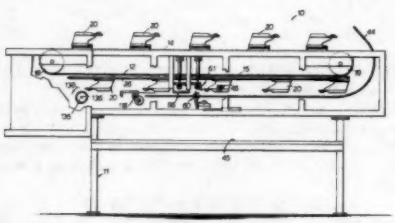
POULTRY BREAST FILLETING SYSTEM

Jacobus E. Hazenbroek; Bastiaan Verrijp, both of Numansdorp, Netherlands, and William L. Wallbridge, Sherfield, England, assignors to Systemate B.V., Numansdorp, Netherlands

Continuation-in-part of Ser. No. 630,658, Jul. 13, 1984, Pat. No. 4,593,432. This application Jun. 9, 1986, Ser. No. 872,172

Int. Cl.[4] A22C *21/00, 17/04*

U.S. Cl. 17—46 **6 Claims**



1. Filleting apparatus for removing the fillets from previously eviscerated poultry carcasses of which the legs, the wings and the skin have been removed already, said apparatus comprising a frame, a conveyor mounted on and movable about said frame, a plurality of carcass carriers mounted on said conveyor at spaced intervals and movable along a path about said frame, each said carcass carriers including a carcass moulding portion that is sized and shaped to approximately fit the previously eviscerated body cavity of a poultry carcass so that the body cavity of a poultry carcass can be mounted on and carried along the path by each carcass carrier with the moulding portion maintaining the shape of the body cavity and a pair of protrusions for engaging the wing sockets of the skeletal structure of the carcass to hold the carcass on the carcass carrier, at least one meat removing implement mounted along the path of said carcass carrier formed with a shape that corresponds to the profile of the skeletal structure of the poultry carcasses, whereby when a poultry carcass is carried by a carcass carrier adjacent the meat removing implement the meat of the carcass is separated from the skeletal structure of the carcass.

4,682,387

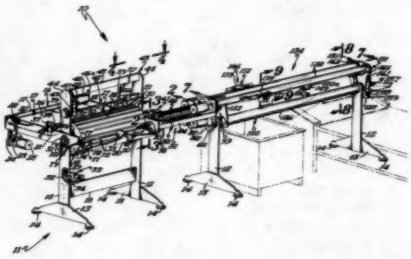
APPARATUS AND METHOD FOR STRIPPING CASING FROM SAUSAGES

Lyndon R. Leining, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Filed Oct. 14, 1986, Ser. No. 918,324

Int. Cl.[4] A22C *11/00, 13/00*

U.S. Cl. 17—49 **14 Claims**



11. A continuous method of mechanically removing the casings from elongate casing-enclosed sausage sticks comprising:

sequentially moving the sausage sticks through a predetermined path of travel, each sausage stick being horizontally disposed during said travel and each sausage stick having a front and rear end, interrupting the travel of the sausage sticks and severing the front end of each sausage stick with a cutting medium,

continuing said travel of the sausage sticks in which each sausage stick is moved, front end first, while maintained in a horizontal position,

mechanically engaging the front edge portions of the casing of each sausage stick with a casing stripping medium during said travel to restrain the front end of the casing as the sausage stick is moved in said path of travel to thereby peel the casing from the front end of the sausage stick,

mechanically gripping the decased front end of the sausage stick with a movable gripping medium and moving the gripping medium and sausage stick in said predetermined path of travel while the casing is restrained by the casing stripping medium to thereby completely peel the casing from the sausage stick, and

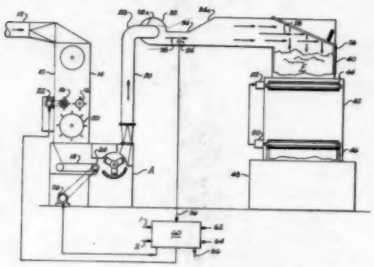
mechanically ejecting the decased sausage from the gripping medium.

4,682,388

TEXTILE FLOCK FEED CONTROL SYSTEM AND METHOD

Akiva Pinto, Gastonia, N.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Aug. 22, 1986, Ser. No. 898,985
Int. Cl.[4] D01H *5/38;* D01G *15/40*
U.S. Cl. 19—105 **17 Claims**



1. A control system for textile processing apparatus such as carding machines and the like, said system including a textile fiber delivery means for delivering fiber in transport air to an associated textile machine, and controllable fiber input means for introducing fiber into the delivery system at a controlled rate, said control system comprising:

fiber sensing means for sensing a function of fiber quantity conditions in said fiber delivery means generating a fiber quantity signal proportional to said fiber quantity conditions;

control means receiving said fiber quantity signal and generating a control signal for controlling said fiber input means to vary the rate of fiber introduction into said fiber delivery means in a predetermined ratio to said fiber quantity conditions;

said control means generating a step control signal which oscillates stepwise generally between a first fiber input rate and a second fiber input rate in response to first deviations of said fiber quantity conditions of a first magnitude; and

said control means generating a control signal which includes an integrated ramp signal having a different fiber input rate than said first and second fiber input rates in response to second deviations in said fiber quantity conditions of a second magnitude greater in magnitude than said first deviations in a manner that changes in said fiber quantity conditions requiring a nontransitory change in fiber input rate are automatically adjusted to without over-reaction to transitory or minor deviations.

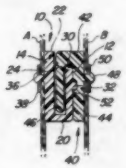
4,682,389

GARMENT CONNECTOR

Robert J. Callender, 7420 Hidden Valley Pl., Roseville, Calif. 95678

Filed Nov. 17, 1986, Ser. No. 931,107
Int. Cl.[4] A44B *13/00*
U.S. Cl. 24—599 **2 Claims**

1. A garment connector comprising a first block-like element having a top, a bottom, opposite sides and front and rear walls and including a cavity opening at the top and extending downwardly between the sides and walls, a second block-like element of inverted U-shaped configuration having a top bight and a pair of legs depending from the bight, one of the legs providing a back wall and the other leg providing a tongue downwardly insertable into and upwardly removable from the cavity in the first element, the tongue being spaced forwardly from the back wall a distance on the order of the thickness of the first element front wall and the tongue being further shaped and dimensioned so as to relatively tightly fit the cavity, detent means yieldingly resisting upward separation of the second element from the first element, including cooperation engageable and disengageable portions respectively on the front wall of the first element and on the back wall of the second element, one detent portion comprising a rib integral with one element



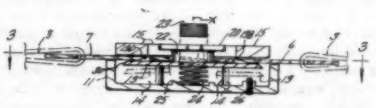
and extending crosswise as respects the line of tongue insertion and removal and the other detent portion being a groove formed in the other element and configured to receive the rib when the detent portions are engaged, and first and second means respectively on the elements for attachment of the respective elements to separate garments.

4,682,390

BUCKLE AND BODY RESTRAINT SYSTEM FOR A VEHICLE

Stanley G. Parrish, 10022 SW. Terwilliger Blvd., Portland, Oreg. 97219

Continuation-in-part of Ser. No. 736,449, May 21, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,361
Int. Cl.[4] A44B *11/26*
U.S. Cl. 24—632 **6 Claims**



1. A buckle within which strap end fittings are releasably secured, said buckle comprising,

a housing including a cover plate, said housing having interior walls defining a cavity of cruciform shape closed by said cover plate, said housing defining openings into which said strap end fittings are inserted, said cover plate having a central opening, and

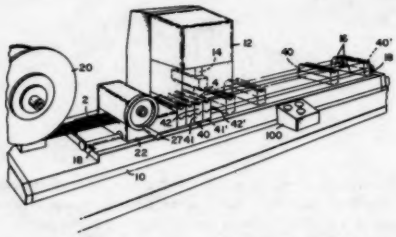
latch means in said cavity and including a latch plate with multiple wings each wing having a detent thereon, a resilient member centrally disposed within said cavity and biasing said latch plate to a latching position whereat the strap end fittings are engaged and retained by said detents, a control member on said latch plate having an upright axis and multiple extremities located in a recessed manner within said central opening of the cover plate, said central opening of a size permitting inclination of the control member relative its axis and axial displacement of the control member along its axis to disengage one or more detent from their respective strap end fittings, said latch plate supported in a rockable and in a slidable manner in said cavity by said resilient member with said interior housing walls confining the plate wings against lateral displacement whereby upon motion being imparted to the latch plate in an asymmetrical manner by fingertip pressure on one of said extremities one detent is disengaged from a strap end fitting or alternatively upon axial displacement of the latch plate by fingertip pressure at the center of said control member all detents are simultaneously released from fitting engagement.

4,682,391

CABLE HARNESS ASSEMBLY APPARATUS

Leslie C. Hall, Jr., Camp Hill; David L. Meyer, and Brian A. Wolfe, both of Jonestown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 21, 1985, Ser. No. 768,078
Int. Cl.[4] H01R 43/04
U.S. Cl. 29—33 M 21 Claims



1. Cable harness assembly apparatus for applying a plurality of connectors having insulation displacing terminals to a ribbon cable, said apparatus being of the type comprising a workstation with a press having a termination ram and a plurality of connector receiving fixtures including a lead fixture which receives the connector to which the cable is first terminated, said apparatus further comprising:

rail means through said workstation and fixed relative thereto, said fixtures being independently journaled to said rail means for movement through said workstation from an upstream to a downstream side thereof,

first stop means at said workstation, said first stop means being effective to stop said fixtures at said workstation sequentially as said fixtures are moved therethrough,

means for moving said lead fixture downstream,

second stop means for stopping said lead fixture at predetermined intervals as it is moved downstream, whereby,

upon aligning a ribbon cable with the connectors in the fixtures, terminating said cable to a connector in the lead fixture, temporarily releasing said first stop means, and moving said lead fixture downstream, said lead fixture will draw said cable through the workstation until the lead fixture is stopped.

4,682,392

ANVIL INSERT FOR FASTENER MACHINE

William G. Revere, Jr., Atlanta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

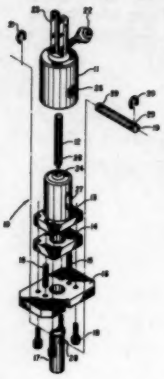
Filed Sep. 23, 1985, Ser. No. 779,371
Int. Cl.[4] B23B 11/00
U.S. Cl. 29—34 B 6 Claims

1. In an apparatus for drilling, countersinking, inserting and forming the head of a rivet in a workpiece, said apparatus comprising an upper ram assembly for holding a workpiece, drilling and countersinking holes in said workpiece and inserting rivets therein for head formation and a lower anvil assembly for holding the workpiece and forming the head on a rivet inserted in said hole by said upper ram assembly, the cooperative function of said upper arm assembly and said lower ram assembly requiring that the drilling, countersinking, inserting and head forming functions be performed along a common longitudinal axis, the improvement comprising:

(a) a base for holding a lower anvil body in a fixed relationship with said upper ram assembly;

(b) anvil insert means having a longitudinal axis that is common with the longitudinal axis of the upper ram assembly so that drilling, countersinking, inserting and head formation functions of said apparatus are performed along said longitudinal axis; and

(c) a lower anvil body mounted on said base and adapted to receive an anvil insert means and hold said anvil insert means in a fixed relationship with said upper ram assembly, said lower anvil body comprising a substantially cylindrical body having an inner bore adapted to receive



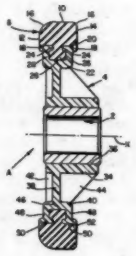
a plunger for movement therein, said body having a mounting flange on one end for attaching the body to said base and on the opposite end a means for attaching said anvil insert means to said anvil body.

4,682,393

SUPPORT ROLLER

Gregory O. C. Corkery, High Ridge, Mo., assignor to Arundale, Inc., St. Louis, Mo.

Division of Ser. No. 616,913, Jun. 4, 1984, Pat. No. 4,567,633.
This application Nov. 25, 1985, Ser. No. 801,467
Int. Cl.[4] B21B 31/00
U.S. Cl. 29—130 13 Claims



1. A support roller comprising: a hub formed in a molding operation from a plastic polymer which shrinks upon cooling from a plastic condition in which it is molded to the solid condition in which it exists in the hub, the hub having a rim provided with side faces and radially outwardly presented friction surfaces that extend generally axially with respect to the axis of rotation, one of the friction surfaces for the hub rim being located between two of the other friction surfaces and being smaller in diameter than the other two friction surfaces, whereby the tire projects radially inwardly past the other two friction surfaces in the form of a root which prevents the tire from being displaced laterally off of the rim, the other two friction surfaces being generally adjacent to respective side faces of the rim; and a tire formed from an elastomeric material and circumferentially surrounding the hub at its rim, the tire having side faces which have substantial flat areas that are

parallel and flush with the side faces of the hub rim where the tire surrounds the rim, so that the flat areas of the sdie faces for the tire form radially outwardly directed continuations of the side faces on the rim without surface interruption, and a plurality of radially inwardly presented contact surfaces which are against the outwardly presented friction surfaces of the hub rim, the tire being under tension in the circumferential direction and having its inwardly presented contact surfaces bearing snugly against the outwardly presented friction surfaces of the hub rim, the tension in the tire existing by virtue of the tire having served as a portion of a mold cavity in which the hub is molded and having been expanded under an outwardly directed force applied by the plastic polymer during the molding of the hub.

4,682,394

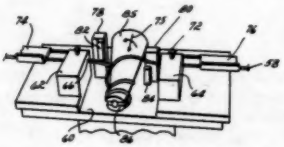
BEDDING AND SEATING PRODUCT HAVING DOUBLE TWIST COIL SPRING AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Thomas J. Wells, Carthage, Mo., and Angelo Serafini, East Boston, Mass., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Division of Ser. No. 769,947, Aug. 27, 1985, Pat. No. 4,639,957. This application Sep. 15, 1986, Ser. No. 907,675

Int. Cl.[4] B21F *35/02*

U.S. Cl. 29—173 **7 Claims**



1. A method of manufacturing a double twist coil spring for use in a bedding or furniture product, which method comprises,

inserting the middle section of a straight length of wire into a rotatable mandrel such that the end sections of the wire extend outwardly from opposite sides of the mandrel,

restraining said end sections of said wire against rotation while rotating said mandrel and said middle section of said wire and while effecting axial movement of said middle section relative to said end sections so as to progressively wrap said end sections about said mandrel and create a coil spring having a diametrically extending middle section and a pair of end sections coiled in the same rotational direction from opposite ends of said middle section, and

increasing the velocity of said axial movement of said mandrel relative to the velocity of said rotational movement over a major portion of the length of said axial movement so as to create a helical double twist coil spring of increasing pitch over a major portion of the length of said coil.

4,682,395

DEVICE FOR PUSHING WHEEL FLANGE HUBS AND SPLINED FLANGE HUBS OF MOTOR VEHICLES OUT OF A SHAFT BEARING

Horst Klann, Terra Wohnpark 12, 7730 Villingen-Schwenningen 24, BRD, Fed. Rep. of Germany

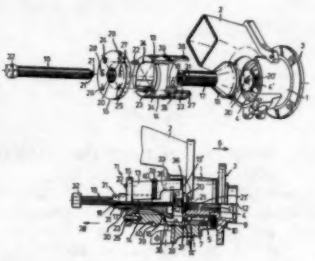
Filed Aug. 1, 1986, Ser. No. 892,483

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530726

Int. Cl.[4] B23P *19/04, 19/00*

U.S. Cl. 29—261 **6 Claims**

1. A device for pushing wheel flange hubs and splined flange hubs of motor vehicles out of a shaft bearing which is press-fitted in a bearing cylinder and which has a bearing cylinder with at least one bearing face having an annular groove for the accommodation of a snap ring, comprising a pressure transmitting part, a threaded spindle supported by the bearing cylinder and disposed on said bearing cylinder, a supporting member resembling an annular disc having a threaded tap hole, two spreader sectors comprising approximately cylindrical cup-like parts arranged diametrically opposite to each other having their one ends anchored so that it can swivel and be on said supporting member and be radially adjustable, said spreader sectors being further provided at their out surface of end portions which extend away from said supporting member with anchoring projections which are insertable in a form closing fashion in the annular groove of said bearing cylinder, said



spreader sectors being spreadable apart, the spindle having an exterior which is threaded and a bore which is threaded and opened at one end supported on the bearing cylinder having one end adjacent the bearing cylinder with a spreading cone, said spreader sectors being disposed around said spindle and being spreadable by said spreading cone which is located beween said bearing cylinder and said spreader sectors, said spindle being threaded into the tapped threaded hole of said supporting member and having an end disposed away from the bearing cylinder which has a wrench engagement head, and a pressure screw having one end which has a pressure transmitting part engaged into the threaded interior bore of said spindle having an outer end with a wrench engagement head.

4,682,396

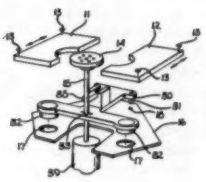
CENTERING/POSITIONING APPARATUS FOR WAFER AND VACUUM CHUCK

Mark Leonov, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 730,374, May 3, 1985, Pat. No. 4,659,094. This application Jun. 9, 1986, Ser. No. 872,022

Int. Cl.[4] G01B *3/30*

U.S. Cl. 29—271 **4 Claims**



1. A device for defining a desired location for a shaft/motor assembly located in a housing having a plurality of fixed openings comprising:

a rigid member having a first and second end;

a first cross member orthogonally disposed on said first end; said first cross member having a pair of first projections thereon, said first projections demountably engaging a first pair of fixed openings in said housing;

a second cross member orthogonally disposed on said sec-

ond end; said second cross member having a pair of second projections thereon; said second projections demountably engaging a second pair of fixed openings in said housing;

said second cross member defining a first aperture therethrough for retaining said shaft of said shaft/motor assembly, said first aperture coincident with said desired location when said projections engage said fixed openings;

whereby said shaft/motor assembly may be easily placed at said desired location.

4,682,397

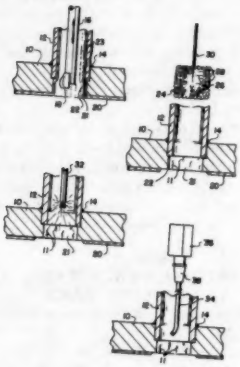
HIGH TEMPERATURE PRESSURE VESSEL INSPECTION PROCEDURE

George H. Harth, III, Wadsworth; Gregory P. Zolton, II, Fairlawn, and Robert L. Copen, Norton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 28, 1986, Ser. No. 834,720

Int. Cl.[4] B23Q *17/00;* **B21C** *43/00*

U.S. Cl. 29—407 **8 Claims**



1. A method for inspecting a tube header bore in a tube header, which has a scale layer deposited thereon, comprising:

rotating a first honing brush having flexible bristles with hard abrasive tips of a course grit in said header bore to remove said scale layer and to expose a clean surface inside said bore;

visually inspecting said clean surface of said bore;

applying a dye to said clean surface of said bore for highlighting any surface defects in said clean surface;

etching at least one line into said scale layer prior to rotating said first honing brush in said bore;

rotating a second honing brush having flexible bristles with hard abrasive tips of a relatively finer grit in said header bore after honing with said first brush, said tube header comprising a tube extending partly into said header bore and leaving an exposed portion of said header bore, the inner diameter of said tube being less than that of said exposed portion of said bore, said honing brushes being inserted through said tube for engaging said exposed portion of said bore; and,

cutting off a portion of said tube at a location spaced from said header.

4,682,398

METHOD FOR REMOVING FORD IGNITION PIN TYPE CYLINDERS

Frank Markisello, 91-10 Liberty Ave., Ozone Park, N.Y. 11417

Filed Jun. 23, 1986, Ser. No. 877,189

Int. Cl.[4] B23P *19/02, 19/00;* **E05B** *15/16;* **B23B** *39/00*

U.S. Cl. 29—426.4 **1 Claim**

1. A method of removing an ignition lock cylinder having a hard disc, from Ford motor vehicles made between 1976 to present, which comprises:

(a) remove wing nut from said ignition lock,

(b) removing two detent pins from face of ignition cylinder,

(c) placing the guide pin portions of the guide tool into said ignition lock cylinder, having two detent holes in face of cylinder,

(d) insert cutter into the guide hole in block, drilling until stop on the cutter comes into contact with the guide block,

(e) remove said cutter from guide hole in guide block,

(f) remove said pin portion of said guide block, from said pin holes of said ignition lock cylinder,

(g) removing said hard steel disc from said ignition lock cylinder,

(h) insert shim into shear line of said ignition lock cylinder, while raking pins through the key way,

(i) when said shim is shimmed into the cylinder up to the stop of the shim, turn cylinder core to the on position and push the cylinder locking pin in,

(j) slide the cylinder out and install new cylinder.

4,682,399

METHOD AND TOOL FOR REMOVING THE NUT WHICH SECURES A FAUCET TO A SINK

Glenn A. Heimbach, 287 E. 7th St., Bloomsburg, Pa. 17815

Filed Jan. 21, 1986, Ser. No. 820,103

Int. Cl.[4] B23P *19/02*

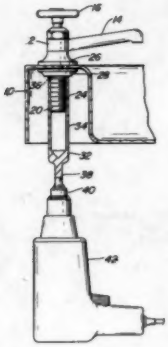
U.S. Cl. 29—426.4 **1 Claim**

1. A method of removing the nut which is in threaded engagement with the exterior threads on the inlet end of a faucet, which is located on the underside of a sink and which secures the faucet to the sink comprising:

(a) providing a one piece tool having at one end a hollow cylindrical portion having a substantially constant cross section with a wall section of about 1/16 of an inch terminating in cutting teeth and at the other end a reduced solid portion, said hollow cylindrical portion having an inside diameter slightly larger than the outside diameter of said exterior threads on said inlet end of said faucet and also having a length longer than the length of said exterior

threads on said inlet end of said faucet, passing without threaded engagement said hollow cylindrical portion over said exterior threads.

(b) placing said reduced solid portion of said tool within the holding chuck of a power drill and closing said chuck to secure said tool to said chuck,



(c) positioning said tool such that said inlet end of said faucet is within said hollow cylindrical portion of said tool, and

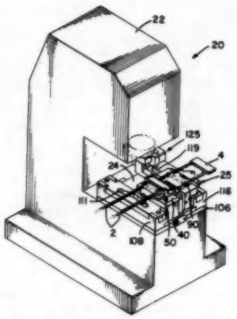
(d) circularly cutting said nut about a circle adjacent the outside diameter of said exterior threads of said inlet end of said faucet to free said nut from said inlet end of said faucet by forcing said cutting teeth of said tool against said nut while rotating said tool by means of said power drill.

4,682,400

TERMINATING APPARATUS

Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 4, 1985, Ser. No. 795,036
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—564.7 **11 Claims**



1. Apparatus for mass terminating conductors to an electrical connector of the type comprising a housing preloaded with a plurality of terminals connected to a carrier strip, each terminal having a conductor receiving portion exposed from the housing, comprising:

a press having a ram and an upper tooling package aligned above a termination station, said upper tooling package being vertically movable by means of the ram towards and away from the terminating station,

a lower tooling package movable to and from said termination station, said lower package comprising housing support means, anvil means which support the exposed conductor receiving portions of the terminal, a shear cooperable with said anvil means to shear said carrier strip on descent of said ram, and terminal loading means above said shear, said terminal loading means being vertically aligned with said terminals by descent of said upper tooling package, and

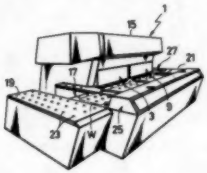
means for advancing said terminal loading means toward said housing support means to load said terminals into said housing during movement of said lower tooling package from said termination station.

4,682,401

MULTIPLE PROCESSING MACHINE

Hirata Tadashi, Yamato; Satou Yoshirou, Atsugi, and Tsutsui Yoshimitsu, Hatano, all of Japan, assignors to Amada Company, Limited, Japan

Filed May 15, 1984, Ser. No. 610,478
Claims priority, application Japan, May 19, 1983, 58-086634
Int. Cl.[4] B23G *3/155*
U.S. Cl. 29—568 **9 Claims**



1. A multiple processing machine for performing a variety of punching and forming operations on sheet-like workpieces comprising:

a frame including first, second and third vertically disposed support plates;

first ram-operated means for punching a sheet-like workpiece;

a first eccentric shaft mounted between said first and second support plates for driving said punching means;

second ram-operated means positioned adjacent said first ram-operated means for impact forming the sheet-like workpiece;

a second eccentric shaft mounted between said second and third support plates for driving said impact forming means;

a first carriage provided on said frame for moving the sheet-like workpiece toward and away from said punching means and said impact forming means; and

a second carriage mounted on said first carriage and movable generally perpendicular thereto for positioning the sheet-like workpiece relative to said punching means and said impact forming means;

a bolster provided on said frame beneath said second ram-operated means for support of a lower forming tool;

a plurality of lower tool rollers supported by said bolster;

means for moving said lower tool rollers with respect to said bolster between a raised position to contact and support said lower tool and a lowered positioned in which said lower tool is supported by said bolster;

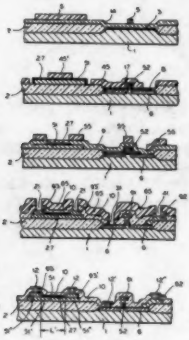
a tool changing apparatus provided on said frame adjacent said second ram-operated means for support of a lower forming tool, said tool changing apparatus having means for storing said lower tool; and

means provided on said frame for exchanging said lower tool between said bolster and said tool changing apparatus.

4,682,402
SEMICONDUCTOR DEVICE COMPRISING POLYCRYSTALLINE SILICON RESISTOR ELEMENT

Yasutaka Yamaguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 15, 1984, Ser. No. 610,827
Claims priority, application Japan, May 16, 1983, 58-85280
Int. Cl.[4] H01L *21/441, 29/04*
U.S. Cl. 29—571 **3 Claims**



1. A method of manufacturing a semiconductor device having a polycrystalline silicon resistor element, said method comprising the steps of forming a first insulating film on a semiconductor substrate, forming a first conductive layer made of a first polycrystalline silicon pattern on said first insulating film for providng said resistor element, forming an island-like pattern of a second polycrystalline silicon layer on a first portion of said first polycrystalline silicon pattern, forming a second insulating film over said first and second polycrystalline silicon layers, opening an aperture in said second insulating film by a reactive ion etching step to expose a part of said island-like pattern of said second polycrystalline silicon layer, forming a wiring layer in contact with the upper surface of said island-like pattern, through said aperture and controlling the resistance of said first conductive layer by reducing the thickness of a portion of said first polycrystalline silicon pattern adjacent to said first portion after forming said first polycrystalline silicon pattern on said first insulating film.

4,682,403
METHOD FOR INTERCONNECTING THE ACTIVE ZONES AND GATES OF CMOS INTEGRATED CIRCUITS

Joël Hartmann, Claix, and Pierre Jeuch, Seyssins, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 25, 1985, Ser. No. 715,512
Claims priority, application France, Mar. 30, 1984, 84 05052
Int. Cl.[4] H01L *21/90, 21/441, 21/443, 29/62*
U.S. Cl. 29—571 **7 Claims**

1. A method for interconnecting active zones of a CMOS device formed in a semiconductor substrate, comprising successively the following:

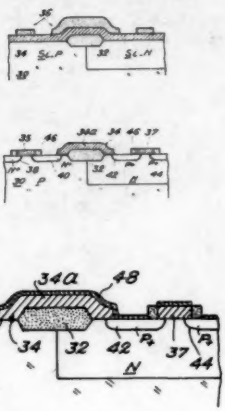
A. depositing a first conductive coating on the entire surface of the substrate;

B. forming on the first conductive coating a mask pattern defining the locations of the interconnection areas and the locations of gates of the CMOS device, and etching the remaining conductive coating;

C. forming said active zones by doping the substrate;

D. removing the mask pattern;

E. forming insulating strips on sides of the gates adjacent to the substrate; and

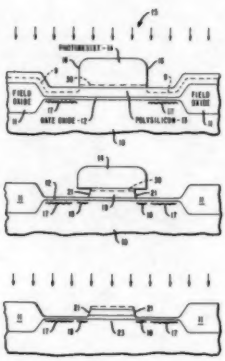


F. depositing a second conductive coating on the entire device except the insulating strips thereby to form interconnections at said interconnection areas.

4,682,404
MOSFET PROCESS USING IMPLANTATION THROUGH SILICON

Gayle W. Miller, Colorado Springs, Colo.; Nicholas J. Szluk, Albuquerque, N. Mex.; George Maheras, and Werner A. Metz, Jr., both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 23, 1986, Ser. No. 922,221
Int. Cl.[4] H01L *21/00*
U.S. Cl. 29—571 **6 Claims**



1. In a process for forming a MOS integrated circuit on a substrate having device active regions, the sequence comprising:

forming a silicon layer which is approximately 150–200 nanometers thick over the device active regions;

forming a mask over the silicon defining first edge boundaries of first source and drain regions;

subjecting the structure to a relatively high energy implant dose for penetrating the silicon layer to form one of an n^+

or a p^+ implant in the surface-adjacent substrate region of the first source and drain region at the first edge boundary;

etching the silicon layer in the presence of the mask to pattern the silicon to a gate electrode of selected lateral dimensions recessed a predetermined dimension beneath the first edge boundaries of the mask;

removing the mask;

subjecting the structure to a relatively low energy implant of the same conductivity type as the high energy implant to form lightly doped regions self-aligned with the first source and drain regions and the gate electrode; and

applying a thermal cycle to activate the implanted species and drive-in the implanted species.

4,682,405

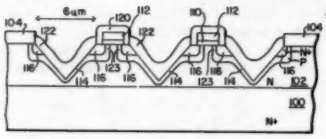
METHODS FOR FORMING LATERAL AND VERTICAL DMOS TRANSISTORS

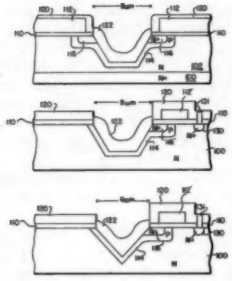
Richard A. Blanchard, Los Altos, and James D. Plummer, Mt. View, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Jul. 22, 1985, Ser. No. 757,582

Int. Cl.[4] H01L *21/425, 21/465*

U.S. Cl. 29—571 **12 Claims**





1. A method for forming a transistor comprising the steps of:

forming a gate on a first region of semiconductor material, said first region having a first conductivity type;

forming a second region having said first conductivity type within said semiconductor material, said second region having a greater dopant concentration than the dopant concentration of said first region;

etching a groove in said semiconductor material, said groove extending through said second region, said groove having a flat bottom;

forming a third region of a second conductivity type opposite said first conductivity type within said first region but surrounding said second region, said third region extending below the bottom of said groove, at least part of said third region being formed to extend below the bottom of said groove after said step of etching said groove; and

depositing a layer of electrically conductive material in said groove, said electrically conductive material forming an electrical contact with said second and third region in said groove.

4,682,406

Patent Not Issued For This Number

4,682,407

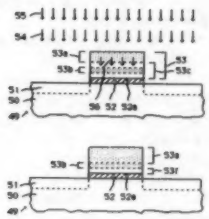
MEANS AND METHOD FOR STABILIZING POLYCRYSTALLINE SEMICONDUCTOR LAYERS

Syd R. Wilson; Richard B. Gregory, both of Phoenix, and Charles J. Varker, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 21, 1986, Ser. No. 821,095

Int. Cl.[4] H01L *29/04, 21/425, 21/265*

U.S. Cl. 29—576 B **25 Claims**



1. A method for controlling dopant migration in polycrystalline semiconductor layers, comprising:

providing a substrate;

forming a polycrystalline semiconductor layer of a first thickness on said substrate, wherein said polycrystalline semiconductor layer has grains therein separated by grain boundaries;

implanting oxygen or nitrogen or mixtures thereof into a first zone of said polycrystalline semiconductor layer to a dose in the range from more than 10^{14} to less than 10^{17} ions/cm^2, wherein said first zone has a second thickness

less than said first thickness and a peak implant concentration located at a predetermined distance below the outward surface of said polycrystalline semiconductor layer and a implant concentration at said outward surface less than said peak concentration;

heating said polycrystalline semiconductor layer to migrate said oxygen or nitrogen or mixtures thereof to said grain boundaries;

thereafter implanting a conductivity enhancing dopant into a second zone of said polycrystalline semiconductor layer; and

heating said polycrystalline semiconductor layer to activate said dopant so that it is electrically active.

4,682,408

METHOD FOR MAKING FIELD OXIDE REGION WITH SELF-ALIGNED CHANNEL STOP IMPLANTATION

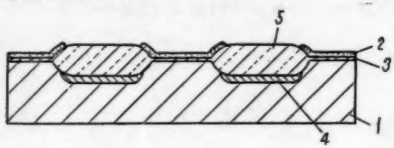
Koji Takebayashi, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Kadoma, Japan

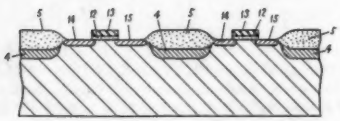
Filed Apr. 1, 1986, Ser. No. 846,736

Claims priority, application Japan, Apr. 1, 1985, 60-68727

Int. Cl.[4] H01L *21/76, 21/94, 21, 72*

U.S. Cl. 29—576 W **4 Claims**





1. Method for making semiconductor device comprising the steps of:

forming a film of silicon dioxide on a semiconductor substrate of one conductivity,

forming a film of silicon nitride on said film of silicon dioxide,

selectively removing said film of silicon nitride to make an opening to expose surface of said film of silicon oxide,

forming a coating of a silicon oxide derivative on all the surface of said substrate,

heat-treating the substrate thereby to change said coating to film of silicon dioxide,

implanting ions of said one conductivity into said substrate through said films of silicon dioxide thereby to form an ion implanted region,

removing said film of silicon dioxide changed from said coating,

selectively oxidizing said substrate by using said film of silicon nitride as a mask, to form selectively oxidized region as isolation region having channel stopper region only under said selectively formed oxide film.

2. Method for making semiconductor device in accordance with claim 1,

said silicon oxide derivative is silanol film which consists of silanol as chief ingredient.

4,682,409

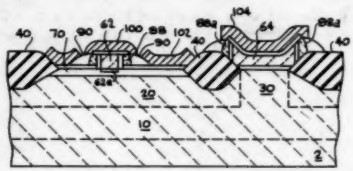
FAST BIPOLAR TRANSISTOR FOR INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR FORMING SAME

Mammen Thomas, San Jose, and Matthew Weinberg, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 21, 1985, Ser. No. 747,517

Int. Cl.[4] H01L *21/28*

U.S. Cl. 29—591 **7 Claims**



1. A method for making an improved vertical bipolar transistor for an integrated circuit structure characterized by improved gain and higher speed while permitting size reduction in both horizontal and vertical directions by the formation of a shallow emitter region and the substantial elimination of an extrinsic base region comprising:

(a) forming an integrated circuit structure having a doped buried collector layer in a silicon substrate with an epitaxial layer formed thereon over said buried layer and isolation oxide portions formed in said substrate to separate said vertical bipolar transistor from adjacent active devices as well as to separate the collector region from the emitter/base regions;

(b) forming an intrinsic base region in said epitaxial layer;

(c) forming a layer of doped polysilicon over said structure;

(d) masking said polysilicon to define at least an emitter region and removing the remainder of said polysilicon to leave a raised polysilicon emitter contact portion;

(e) forming an oxide layer over said structure and, at the same time, forming a shallow emitter region in said structure by the following steps:

(1) growing a thin oxide protective coating over said silicon by heating the silicon to temperature and for a time period sufficient to diffuse dopant from said raised polysilicon emitter contact portion into said intrinsic base region in said epitaxial layer of said substrate to form a shallow emitter region having a depth of less that 1000 Å; and

(2) depositing sufficient additional oxide over said thin protective coating to provide a total oxide layer having a thickness of about 2500–5000 Å;

whereby said additional thickness of oxide does not result in further diffusion of said emitter region into said structure;

(f) removing portions of said oxide layer by reactive ion etching to leave oxide spacers portions on the sidewalls of said raised polysilicon emitter contact portion;

(g) forming a metal silicide contact for said intrinsic base region on said portion of said epitaxial layer exposed by removal of said oxide layer;

(h) forming an insulation layer over said structure;

(i) planarizing said insulation layer to expose said raised polysilicon emitter contact portion; and

(j) forming the remaining contacts to said bipolar transistor through said insulating layer;

whereby the provision of a shallow emitter region in said structure and the substantial elimination of an extrinsic base region by said metal silicide base contact permits the vertical dimension of said transistor to be reduced and the elimination of diffusion from an extrinsic base region into said emitter region and the provision of said oxide spacers between said raised polysilicon emitter contact portion and said metal sili-

cide permit the horizontal dimension of said transistor to be reduced.

4,682,410

PROCESS OF MAKING A DYNAMO ELECTRIC MACHINE

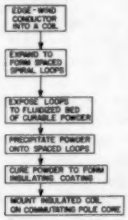
Helmut Kreuzer, and Klaus-Peter Meier, both of Schwieberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 409,561, Aug. 19, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,799

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147221

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—596 **5 Claims**


EDGE-WIND CONDUCTOR INTO A COIL
EXPAND TO FORM SPACED SPIRAL LOOPS
EXPOSE LOOPS TO FLUIDIZED BED OF CURABLE POWDER
PRECIPITATE POWDER ONTO SPACED LOOPS
CURE POWDER TO FORM INSULATING COATING
MOUNT INSULATED COIL ON COMMUTATING POLE CORE

1. Method of making a commutating pole, for use in a vehicular-type dynamo electric machine, comprising the steps of:

winding a strip of conductor (6), having essentially rectangular cross-sectional configuration, on edge;

permitting the completed edge-wound winding to resiliently expand to form spaced spiral winding loops having major surfaces facing one another;

exposing said expanded spaced spiral loops to a fluidized bed in which a powder, comprising a curable, hardenable insulating material, is suspended, said powder precipitating on the conductor forming the winding loops;

hardening or curing said powder precipitated on the winding loops to form a coalesced insulating coating on each of said facing major surfaces of said spiral winding loops; and

mounting the thus-insulated edge-wound winding on a commutating pole core (4) of said dynamo electric machine.

4,682,411

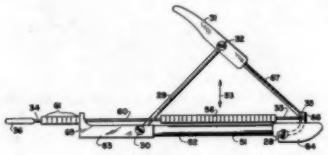
WIRE IDENTIFYING SLEEVE APPLICATOR

Herbert Tomes, Jr., Rte. 3, Box 1160, Callahan, Fla. 32011

Filed Aug. 21, 1986, Ser. No. 898,630

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—745 **14 Claims**



1. A tool for applying identifications sleeves to electric wires including a sleeve mandrel and a mandrel stripper, said sleeve mandrel comprising an elongated thin straight rod having a loading end and a discharge end and adapted to have identification sleeves threaded onto said rod, said mandrel stripper comprising a plurality of telescoping tubular members having a retainer affixed to one end of said telescoping tubular members for anchoring the loading end of said mandrel and a stripping guide affixed to the other end of said telescoping tubular members adapted to encircle said mandrel adjacent the discharge end thereof, said mandrel having at said loading end fastening means for attachment to said retainer and at said discharge end a plurality of springy lengthwise fingers; and means to move said stripping guide linearly along said mandrel until said guide extends beyond said springy fingers.

4,682,412

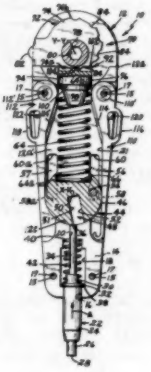
INSERTION TOOL

George B. Pfeffer, Minnetonka, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Feb. 19, 1986, Ser. No. 830,979

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—750 **9 Claims**



1. A tool comprising:

a manually engageable handle;

an impact receiver having a force receiving end and a force transmitting end, said receiver carried on said handle and slideable in a predetermined direction extending between said ends;

an impactor carried on said handle on a side of said impact receiver opposing said force receiving end and slideable in said predetermined direction between a rest position and a displaced position, said impactor pivotally movable about a pivot axis between a load position and a fire position with said impactor presenting a first surface opposing said force receiving end in force transmitting relation when in said load position and presenting a second surface opposing said force receiving end in force transmitting relation when in said fire position, said second surface spaced away from said first surface on a side of said first surface away from said force receiving end;

first urging means for yieldably urging said impactor toward said force receiving end and toward said load position;

means for pivoting said impactor about an axis laterally spaced from said second surface against urging of said first urging means to said fire position as said impactor is moved to said displaced position;

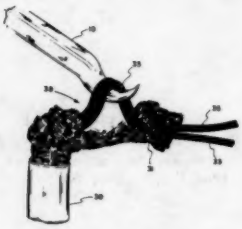
second urging means for yieldably urging said impact receiver away from said impactor; and

said impactor including a pivot surface cooperating with a fixed opposing surface secured to said handle to define said pivot axis.

4,682,413
METHOD OF EXTRACTING INSULATED WIRES FROM A SHIELDED CABLE

Ron F. Keller, San Jose, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Dec. 22, 1986, Ser. No. 944,914
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—825 **10 Claims**



1. A method of extracting a portion of an insulated wire from within a braided wire shielded cable with a minimum of damage to the wire insulation, said method comprising:

stripping a section of outer insulation covering one end of said cable exposing a predetermined portion of said braided wire shield;

sliding said exposed portion of said braided wire shield back against the edge of remaining outer insulation causing a portion of said braided wire shield to distend and thereby loosening some of said braided wires comprising the shield;

separating some of said loosened braided wires to form an aperture in said shield and thereby exposing a section of said insulated wire;

bending said cable at said aperture to further expose said insulated wire;

inserting the rounded tip of an elongated tool between said insulated wire and said shield causing said wire to separate from said shield, said elongated tool having an arcuately-shaped tapered head with a substantially elliptical tip portion;

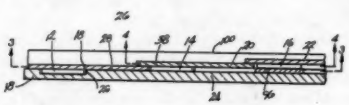
using said insulated wire as the axis of rotation, continuously pushing and rotating a greater portion of said tool head between said insulated wire and said shield, while also twisting said tool with a side-to-side motion,

when said insulated wire reaches the body of the tool, pulling said insulated wire out of said aperture removing it from said braided wire shield.

4,682,414
MULTI-LAYER CIRCUITRY

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 413,046, Aug. 30, 1982. This application Jun. 24, 1985, Ser. No. 747,589
Int. Cl.[4] H05K *3/32*
U.S. Cl. 29—840 **12 Claims**



1. A process of forming multi-layer circuitry adapted to incorporate electronic elements, comprising the steps of:

providing a metallic substrate formed of a first material and providing a first metallic layered conductive circuit pattern and a second metallic layered conductive circuit pattern each formed of said first material, said first material having a third coefficient of thermal expansion, said third coefficient of thermal expansion being from about 165×10^{-7} to about 170×10^{-7} in/in/°C;

providing said metallic substrate with at least a first recess extending from a surface thereof, said recess and said surface being adapted to receive at least a first and second electronic element, respectively;

providing said first metallic layered conductive circuit pattern with at least a first cavity therein for receiving said second electronic element, with said first metallic layered conductive circuit pattern being capable of being electrically connected to said first electronic element;

disposing a layer of first dielectric material on said surface of said metallic substrate;

overlying said layer of first dielectric material with said first metallic layered conductive circuit pattern

overlying a portion of said first metallic layered conductive circuit pattern with said second metallic layered conductive circuit pattern;

disposing a layer of second dielectric material between said first and second metallic layered conductive circuit patterns thereby electrically insulating said first and second metallic layered circuit patterns from each other;

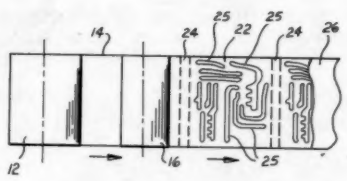
selecting said first and second dielectric materials from the group consisting of glass and ceramic, said first and second dielectric materials having first and second coefficients of thermal expansion, respectively, each of at least about 160×10^{-7} in/in/°C., said first and second coefficients of thermal expansion of the first and second dielectric materials being closely matched to the third coefficient of thermal expansion of said first material; and

bonding said first layer of dielectric material to said substrate and said first conductive circuit pattern, while bonding said second layer of dielectric material to said first and second conductive circuit patterns, thereby essentially eliminating thermal stress in the multi-layer circuitry caused by thermal cycling.

4,682,415
METHOD OF MAKING PRINTED CIRCUITS

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Oct. 28, 1985, Ser. No. 791,841
Int. Cl.[4] H05K *3/20*
U.S. Cl. 29—846 **7 Claims**



1. A method of fabricating printed circuits comprising providing a conductive pattern producing means which can impart electrically conductive material in a given circuit pattern composed of a plurality of independent conductive paths, passing a strip of electrically nonconductive material in cooperative association with said means to cause said given pattern to be repeatedly imparted to separate successive zones of the strip thereby forming a succession of identical printed circuit zones separated from each other along said strip, and then coiling the strip to form a coiled supply of printed circuits for subsequent use as desired, and further including the steps of uncoiling the coiled strip and joining it to a more rigid backing, creating a desired hole pattern in each printed circuit passing through both the strip and the backing, and of severing the

strip between successive zones to form separated individual printed circuits.

4,682,416

METAL CUTTER

Kazimir Stolfa, 46 Wimbledon Avenue, Narrabeen, N.S.W. 2101, Australia

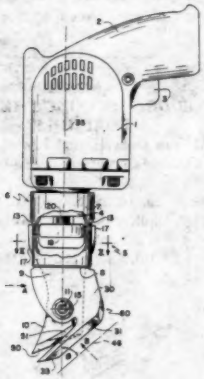
PCT No. PCT/AU84/00143, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00541, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 25, 1984, Ser. No. 723,951

Claims priority, application Australia, Jul. 26, 1983, PG0482

Int. Cl.[4] B26B *15/00*

U.S. Cl. 30—228 **9 Claims**



1. A power driven portable head for a sheet metal cutter working on the guillotine principle as set forth above, having two blades pivoted to move relative to one another one of which is fixed to the head the other being mounted to oscillate about the pivot axis during operation of the head, the fixed blade having a leg portion attached to the head and, at its free end a foot extending laterally away from the plane of the leg portion, a straight edge on the foot adjacent the leg portion being formed with a first shearing face displaced laterally away from the plane of the leg portion on its side opposite to that at which the movable blade is pivotally mounted, the movable blade having one end portion adjacent the head arranged to be oscillated about the pivot axis by a portable rotational drive applied to the head, and its other end portion shaped to pass beneath the free end of the leg portion and to terminate in a second shearing face which co-operates with the first shearing face both said first and second shearing faces lying in a plane spaced from but parallel to the plane of the leg portion.

4,682,417

SPLITTING TOOL

Frederick L. Henslin, 619 Hallowell La., and Clarence Perkins, 4547 Murphy Ave., both of Billings, Mont. 59101

Filed May 5, 1986, Ser. No. 859,337

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—294 **2 Claims**

1. A splitting device for splitting open a carcass or wood and the like comprising:

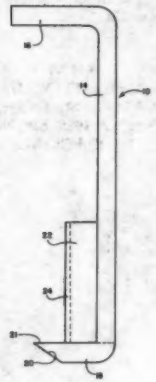
a straight shank;

the shank being bent at one end thereof to form a handle which extends in a transverse direction from the shank;

a foot member secured to the other end of the shank, which foot member extends in the transverse direction;

the foot member being rounded on the bottom surface and further having a flat top surface, the foot member further tapering in the transverse direction at the bottom thereof to a smaller dimension at the edge of the foot furthest from the shank;

an elongate cutting blade member having a trailing edge which has the same lateral dimension as the cross-sectional dimension of the shank, the cutting blade member being secured to the shank adjacent and above the foot



member, the cutting blade member further having a leading cutting edge which faces in the transverse direction (.); and

an elongate striker bar having a bore at one end shaped to receive the handle and having a length such that when the striker bar receives the handle, the other end of the striker bar rests on the top surface of the foot member.

4,682,418

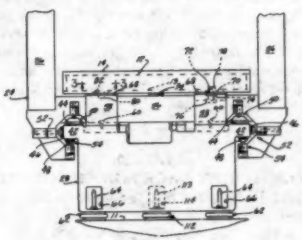
COORDINATE MEASURING MACHINE

John J. Tuss, Englewood, and Robert D. Donaldson, Centerville, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 7, 1986, Ser. No. 882,572

Int. Cl.[4] G01B *7/03*

U.S. Cl. 33—1 M **10 Claims**



1. A coordinate measuring machine (**10**) with an improved table-base structure, said machine (**10**) of the type including a base (**28**); a generally rectangular table (**12**) having a planar upper surface (**14**) means (**58a, 58b,**) supporting said table on said base, a bridge (**24**) having upstanding side members (**26**) extending above and alongside said table; an upper cross member (**22**) connecting the upper ends of said upstanding side members (**26**) and a lower cross member (**56**) connecting the lower ends of said upstanding members (**26**) and passing beneath said table (**12**); guide means (**42**) mounting said bridge for guided movement along a first horizontal axis; a carriage (**20**) supported on said bridge (**24**) for movement along a second

horizontal axis orthogonal to said first axis; and a probe (18) supported for vertical movement on said carriage (20); the improvement comprising:

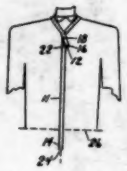
an elongated table extension member (84) affixed to one side of said table (12) and extending away in a direction parallel to said first axis, with an extension member support (86) fixed to said base and located beneath the outer end of said table extension member (84), said extension member support comprising additional means supporting said table (12) on said base (28).

4,682,419

NECKTIE-TYING GAUGE

Leo E. Lynch, 1738 Virginia St., Racine, Wis. 53406

Filed Nov. 12, 1985, Ser. No. 797,201
Int. Cl.[4] G01B 3/00
U.S. Cl. 33—613 2 Claims



1. An improved gauge to aid in tying neckties into proper alignment comprising:

a long narrow flexible non-garment piece of predetermined fixed length and suitable for temporary draping around one's neck, said piece having a proximal end and a distal end;

at least two snap-type end fasteners permanently affixed to the piece immediately adjacent to the proximal end;

at least two snap-type middle fasteners for selective cooperative engagement with one of said end fasteners, said middle fasteners being permanently affixed to the piece at a predetermined intermediate position spaced from the end fasteners by a distance more than the circumference of one's neck, the end and middle fasteners being joinable without additional fastener means; and

the middle fasteners spaced apart by a short distance such that each of them when joined to one of the end fasteners provides proper tie end and crossover positions for a particular selection of knot, and the end fasteners spaced apart by a short distance whereby the gauge is adaptable for use by men of differing neck circumferences,

whereby with the fastening means joined and the piece hanging along one's shirtbutton line the distal end and the attachment point serve as references for proper necktie positioning and initial crossover in tying.

4,682,420

CENTER HEIGHT GAGE FOR CUT-OFF TOOLS

Bradley Teets, Budd Lake, N.J., assignor to Iscar Ltd., Nahariya, Israel

Filed Dec. 8, 1986, Ser. No. 938,807
Int. Cl.[4] G01B 5/24
U.S. Cl. 33—626 7 Claims

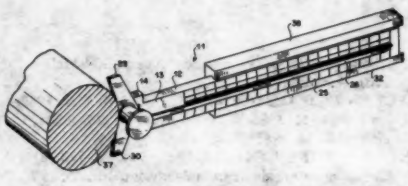
1. A gage for measuring the center height of a cylindrical workpiece comprising:

(a) a body having an arcuate face portion with a plurality of sequential numbers thereon indicating a value of diameter of said workpiece;

(b) a plurality of substantially vertical lines on said face portion, each line corresponding to each one of said sequential numbers;

(b) a horizontal centerline extending across said face portion;

(d) a plurality of horizontal indicator lines extending above and below said centerline, each line indicating a value corresponding to a distance above or below the center height of said workpiece; and



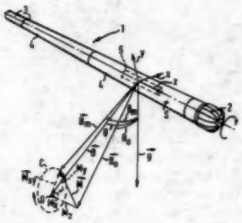
(e) an indicator pivotably mounted on said body comprising an indicator arm positioned along said horizontal centerline and a pair of feeler arms spaced apart a predetermined angle.

4,682,421

METHOD FOR DETERMINING THE AZIMUTH OF A BOREHOLE

Johannes C. M. van Dongen, and Leo B. Maekiaho, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 26, 1986, Ser. No. 832,948
Claims priority, application United Kingdom, Feb. 26, 1985, 8504949
Int. Cl.[4] E21B 47/02
U.S. Cl. 33—302 9 Claims



1. A method for eliminating the influence of drill string magnetization on an azimuth measurement made by a magnetometer package fixedly mounted to a drill string, said method comprising:

rotating the drill string;

measuring a cross-axial component B_m of a magnetic field B for various rotational orientations of the drill string;

determining a portion of the measured cross-axial component B_m produced by a cross-axial drill string magnetization M_{xy};

utilizing the cross-axial drill string magnetization M_{xy} to eliminate its influence on azimuth measurements.

4,682,422

BOWLERS' HAND-DRYING BAG

Bob Harris, 7396 Van Buren St., Ventura, Calif. 93003

Filed Jul. 15, 1986, Ser. No. 885,668
Int. Cl.[4] F26B 5/16
U.S. Cl. 34—9 8 Claims

1. A bowler's aid for drying the bowling hand, comprising:

a container bag made from tricot knitted fabric having a gauge of between 28 and 36, said fabric being made of 100% manmade fibers having a yarn size of between 15 and 45 denier, said bag being substantially closed off and providing minute pores through which may escape a dust contained in said bag;

and fuller's earth sericitic contained in said container bag for

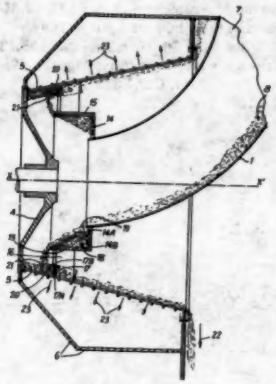
escape through said minute pores when said container bag is shaken and vibrated, whereby when said bag is held in a hand and shaken, a fine dust is caused to effuse through said pores to dry the hand from moisture.

4,682,423

CENTRIFUGAL DRIER DRUM FOR WET GRANULAR MATERIAL

Pierre Gaget, La Mure, France, assignor to Charbonnages de France, Paris, France

Filed Apr. 23, 1986, Ser. No. 854,896
Claims priority, application France, Apr. 26, 1985, 85 06402
Int. Cl.[4] F26B *17/30*
U.S. Cl. 34—58 **11 Claims**



1. Centrifugal drier drum comprising a peripheral drying wall arranged for rotation about an axis, an entry part within the drum for receiving material to be dried, and a plurality of supports fixing the entry part within the drum, the entry part having an impact zone and the peripheral drying wall having a projection zone at which material is received, wherein at least one of said impact and projection zones, an annular retaining space is defined and is arranged during operation to retain from the circulating material to be dried on the travel path thereof a quantity of said material such that the retained material defines a surface onto which the further incoming material to be dried is projected.

4,682,424

CLOTHES DRYING APPARATUS

Arlillian Irving, 5813 Bonnieview, #1135, Dallas, Tex. 75241

Filed Oct. 16, 1986, Ser. No. 919,799
Int. Cl.[4] F26B *9/06*
U.S. Cl. 34—151 **7 Claims**

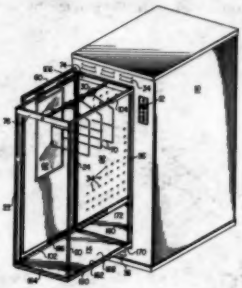
1. A clothes drying apparatus comprising:

a cabinet structure having an interior;

a hanger rod assembly;

a drip assembly, wherein said hanger rod assembly and drip pan assembly are slidably mounted within said interior of said cabinet structure so that said hanger rod assembly and said drip pan assembly each have a first position located within said cabinet structure and each have a second position located partially outside of said cabinet structure; and

further comprising a means connecting said hanger rod assembly and said drip pan assembly so that said hanger rod assembly and said drip pan assembly may be moved from their first positions to their second positions in a coordinated fashion, where said drip pan assembly remains in a location substantially beneath said hanger rod



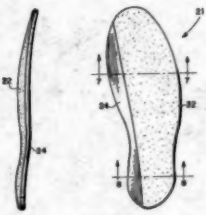
assembly when said rod and drip pan assemblies are in their first positions and their second positions.

4,682,425

ADAPTERS FOR GOLF SHOES

Ronald G. Simmons, Rte. 8, Box 224, Russellville, Ala. 35653

Continuation-in-part of Ser. No. 824,451, Jan. 31, 1986, abandoned. This application Jun. 30, 1986, Ser. No. 880,283
Int. Cl.[4] A43B *13/40, 13/38, 5/00*
U.S. Cl. 36—44 **6 Claims**



1. An insole for golf shoes comprising:

a first insole portion formed to have heel and sole areas to fit within a golf shoe, said first insole portion having a uniform thickness; and

a second resilient insole portion attached to said first insole portion having a non-uniform thickness in which said second insole portion increases the thickness of said insole along a lateral edge thereof, said thickness having a first maximum adjacent the ball of the foot area of said insole, tapering to zero thickness at the toe area, to a minimum thickness at an instep area, and to zero thickness along a line spaced apart from a medial edge of said insole, and a second maximum along the lateral edge of the heel area of said insole and tapering to zero thickness along said line and to said minimum thickness at said instep area.

4,682,426

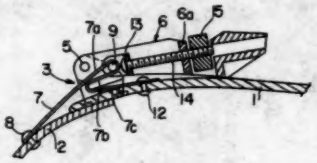
SKI BOOT TIGHTENING DEVICE

Jean-Louis De Marchi, Duingt, France, assignor to Salomon S.A., Annecy, France

Filed May 29, 1986, Ser. No. 867,988
Claims priority, application France, May 31, 1985, 85 08207
Int. Cl.[4] A43C *11/00*; A43B *5/04*
U.S. Cl. 36—50 **14 Claims**

1. Device for tensioning a flexible element assuring a connection between two parts, applicable particularly to the closure and tightening of a ski boot on the foot of a skier, about a

transverse axis, said lever controlling the tensioning of said flexible element which is attached at its respective ends to said two parts, wherein said flexible element passes around a first, movable counter-element (9) carried by said tensioning lever



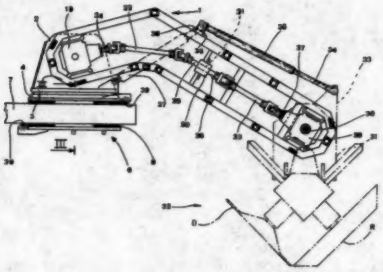
(6), forming a first loop (*7a*, *7b*), then passes around a second, fixed counter-element (11; 16; 27; 31), forming a second loop (*7b*, *7c*,) said flexible element (7) and said two counter-elements (9; 11; 16; 27) constituting the equivalent of a clamp.

4,682,427

TRENCH-DIGGER IMPLEMENT CARRIED BY A LATERALLY EXTENDING BOOM AND DRIVE THEREFOR

Giuliano Dondi, Mirandola, Italy, assignor to Pietro Dondi & Figli S.r.l., Modena, Italy

Filed Jul. 18, 1985, Ser. No. 756,226
Int. Cl.[4] E02F *5/08*
U.S. Cl. 37—91 **2 Claims**



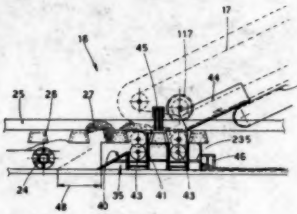
1. A trench digger implement carried by a laterally-extending boom and provided with a drive transmission having universal joints, comprising a boom (1) having a box structure mounted on a slewing ring (3') and rotatable for positioning about a vertical axis by way of a hydraulic ram (40), said slewing ring being carried by a longitudinal trolley (6) actuated by a hydraulic ram (11), wherein the boom is hinged at a rear end thereof connected to the trolley about an axis disposed transversely with respect to a longitudinal axis of the boom and driven from a power take-off (18) of a tractor (16) through a telescopic drive cardan shaft (17) having two universal joints, said implement (32) being suspended from and hinged about an axis also disposed transversely at a forward end of the boom to which said implement is connected, said boom being raised by a pair of longitudinal hydraulic rams (37), a penetrating angle defined between the rotational axis of the implement and the ground being adjusted by a longitudinal hydraulic ram (35); and further comprising two right angle drive gear units located at the rear end (19) and forward end of the boom, respectively, one inside each end of the laterally-extending boom; a first of said gear units (19) being provided with a transverse input shaft (29) located at a side of said gear unit facing the power take-off of the tractor and driven by said power take-off by way of said telescopic drive cardan shaft with said universal joints, and with a longitudinal output shaft (24); a second of said gear units (28) being provided with a longitudinal input shaft (27) and a transverse output shaft (30) which extends in the opposite direction to the input shaft of the first gear unit and drives the shaft with said universal joints driving in turn the input shaft of the implement gearbox; the boom being further provided with a longitudinal intermediate shaft (21) journalled rotatably in the boom, one end (25) of which connects by way of a drive shaft with said universal joints (22) to the longitudinal output shaft of the first gear unit, and the other end (26) of which connects by way of a drive shaft with said universal joints (23) to the input shaft of the second gear unit.

4,682,428

RAILWAY BALLAST RENEWAL MACHINE FOR TUNNELS

Ivo Cicin-Sain, Bussigny-Laus., Switzerland, assignor to Danieli & C. Officine Meccaniche SpA and ITI/CLM Impianti Tecnici Industriali SpA, both of Buttrio, Italy

Filed May 20, 1986, Ser. No. 865,127
Claims priority, application Italy, May 24, 1985, 83371 A/85
Int. Cl.[4] E02F *5/22*
U.S. Cl. 37—104 **20 Claims**



1. A railway ballast renewal machine for renewing a railway road bed having rails attached to spaced sleepers embedded in metalling, comprising:

a frame;

a scarifier to loosen the metalling around the sleepers;

a work unit to grip the rails and remove the metalling;

a riddle to sort the metalling; and

a means to spread retained metalling;

wherein said work unit comprises gripping means to grip the rails and removal means to lift out the metalling through spaces between successive sleepers of the railway roadbed.

4,682,429

TROUSERS-PRESS

Cornelis E. G. Okkerse, Hoornbruglaan 36, Rijswijk, Netherlands

Filed Dec. 31, 1985, Ser. No. 815,009
Claims priority, application Netherlands, Jan. 3, 1985, 8500012
Int. Cl.[4] D06F *71/12*
U.S. Cl. 38—36 **6 Claims**

1. A trouser press comprising:

(a) a substantially upright first press plate;

(b) a second press plate pivotally movable relative to said first press plate;

(c) means for clamping said press plate together;

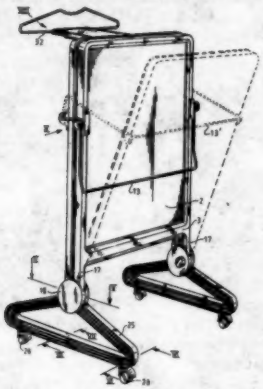
(d) a plurality of support frames comprising upright sides and transverse top and bottom portions;

(e) each of said press plates being mounted within one of each said support frames;

(f) a pair of frame hinge arms extending below said bottom transverse portion and forming a continuation of said upright portions;

(g) said frame hinge arms being coupled to a hinge support

which is in the shape of a casing, said casing being provided with a first space for receiving a hinge arm of the



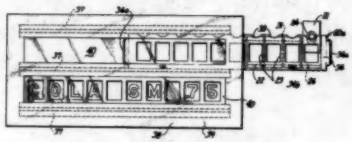
one frame, and a second space for pivotally receiving the hinge arm of the other frame.

4,682,430

PRICE CHIP SUPPORT STRIP

Charles F. Ramsay, Knoxville, Tenn., assignor to Plasti-Line, Inc., Knoxville, Tenn.

Filed Mar. 27, 1986, Ser. No. 844,672
Int. Cl.[4] G09F *3/20*
U.S. Cl. 40—5 **7 Claims**



1. A utilized elongated substantially rigid support strip for price chips or the like comprising,

a front panel portion which is elongated and substantially rectangular and provided along its length with a plurality of equidistantly spaced equal size price chip display openings, the front panel portion having a substantially flat front face and being provided on its rear side with a plurality of top-to-bottom extending spaced parallel ribs of equal thickness rearwardly of the front panel portion, said ribs being disposed on opposite sides of said price strip display openings, said front panel portion being further provided in its rear side with a pair of parallel longitudinal ledges of the same thickness as said ribs rearwardly of the front panel section, said ledges defining top and bottom longitudinal edges of the front panel portion,

a rear elongated flat substantially rectangular panel portion which is substantially coextensive lengthwise with the front panel portion and engaging the rear faces of said ribs and extending across the ribs, the rear panel portion having display openings corresponding in number, size and spacing with the display openings of the front panel portion and being in substantial registration therewith, the rear panel portion being of lesser height than the front panel portion and having top and bottom longitudinal parallel edges spaced respectively below and above the corresponding longitudinal edges of the front panel portion in parallel relationship thereto and below and above said ledges of the front panel portion, the front and rear panel portions defining rectangular price chip pockets within the support strip between said ribs and ledges, the front panal portion having finger recesses in its top longitudinal edge with one such recess adjacent to the top portion of each price chip pocket, whereby the upward removal of each price chip from its pocket is facilitated, and

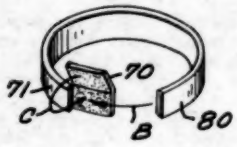
pairs of projections formed on the front face of the rear panel portion above and below said display openings and being engageable with price chips being held in said pockets to position the price chips normally against the rear of the front panel portion and within the margins of said pockets which are defined by said ribs and ledges.

4,682,431

HOSPITAL ARM BAND

William M. Kowalchuk, Downsview, Canada, assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 23, 1985, Ser. No. 737,087
Claims priority, application Canada, Jun. 13, 1984, 456435
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—21 C **9 Claims**



2. An identification band blank comprising: an elongated strip of material having side edges and a centrally disposed longitudinal axis, said strip having a top surface receiving data on at least a part thereof, and a bottom surface covered with a permanent pressure sensitive adhesive; and means extending from one side edge of said strip to said longitudinal axis for separating one longitudinal half of said strip into a relatively short tab portion and a relatively long body portion; said body portion foldable about said longitudinal axis so that the adhesive surface of said body portion overlies and is bondable to the adhesive surface of the other longitudinal half of the strip to form a band portion, wherein said band portion is bendable to bring its free end into overlapping relationship with the adhesive surface opposite said tab portion and is bondable thereto, and said tab portion is foldable about said longitudinal axis with its adhesive surface overlying and being bondable to said free end of the band portion to produce a closed loop with said data receiving surface.

4,682,432

SELF-SUPPORTING ELEMENT FOR MOSAIC DISPLAY PANEL

Frank S. Taylor, St-Eustache, and Claude Bourdon, Boisbriand, both of Canada, assignors to Monitronik Ltee, Boisbriand, Canada

Filed Jun. 28, 1985, Ser. No. 749,645
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—573 **22 Claims**

1. A light assembly for mounting to a synoptic mosaic panel structure formed of an arrangement of vertical and horizontal rails and of an arrangement of inter-engaged self-supporting hollow blocks, said block arrangement being mounted to said rail arrangement, said assembly comprising:

(a) a tile adapted to be mounted to one end of one of said hollow blocks, said tile having at least one transparent surface portion

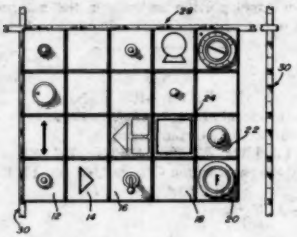
(b) light-conducting means received in said one hollow block extending from said one end to an opposite end thereof;

(c) light-diffusion means at one end of said light-conducting means;

(d) a second hollow block adapted to be mounted rearwardly of said one hollow block at said opposite end thereof;

(e) baffle means in said second hollow block dividing said block in two or more chambers;

(f) light coloring means at the opposite end of said light-conducting means, displaying a geometrical pattern of colored areas, each area corresponding in shape to the cross-sectional area of an associated chamber disposed in registry therewith; and



(g) light source means in each said chamber whereby light emitted from one of said source means is colored by the registered area of said light coloring means associated therewith, transmitted through said light-conducting means to said diffusion means, and emerges through said transparent surface portion of said tile.

4,682,433

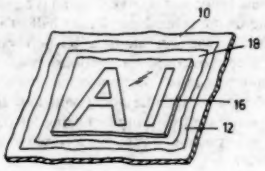
FABRIC SIGN PANEL

Johann Stilling, 1141 Royal York Road, Apt. A1001, Islington, Ontario, Canada

Filed Mar. 28, 1985, Ser. No. 717,318

Int. Cl.[4] G09F *19/00*

U.S. Cl. 40—615 **1 Claim**



1. A method of applying graphics to a vinyl fabric panel, for use as a sign or the like and comprising the steps of:

applying to a panel of vinyl fabric material, an undercoating layer in a liquid state, said undercoating layer comprising a vinyl solvent based transparent coating, said undercoating layer being applied in at least the region were said graphics are to be located, as allowing said undercoating layer to dry:

forming graphics on a transfer panel, said transfer panel incorporating a water soluble release material, and applying water to said transfer panel, whereby to release said graphics from said transfer panel, and deposit the same on said undercoating layer, and thereafter removing said transfer panel, and drying said graphics, and,

applying and outercoating layer over said graphics and said undercoat layer, said outercoating layer comprising a transparent vinyl solvent based coating material in a liquid state, and allowing said outercoating layer to cure.

4,682,434

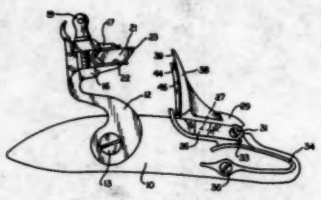
FLINTLOCK IGNITION MECHANISM

Thomas J. Wurm, 1041 Winchell Rd., Aurora, Ohio 44202

Filed Aug. 7, 1986, Ser. No. 893,982

Int. Cl.[4] F41C *27/00*

U.S. Cl. 42—51 **11 Claims**



1. In a flintlock firearm having a lockplate, a hammer pivotally mounted on said lockplate, a flint carried on said hammer, a pan adapted to receive a priming charge and a frizzen constructed and positioned to be struck a blow by said flint on firing, the improvement comprising a pyrophoric element mounted on said frizzen and engageable by said flint on firing, whereby said flint abrades particles from said element and drives them into said pan.

4,682,435

SAFETY SYSTEM FOR DISABLING A FIREARM

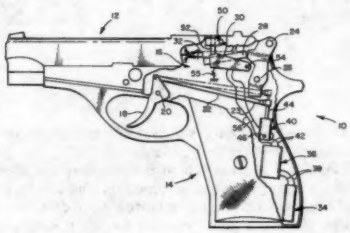
James Heltzel, Rte. 1, Box 351, Mauertown, Va. 22644

Filed Mar. 14, 1986, Ser. No. 839,616

The portion of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.[4] F41C *17/00, 17/04*

U.S. Cl. 42—70.01 **9 Claims**



1. A safety system for selectively disabling a firearm comprising:

a mechanical linkage by which the firearm is fired by movement of a trigger, said mechanical linkage including a link element;

a link mounting means for mounting said link element for movement between a position wherein said mechanical linkage is interrupted and a position wherein said mechanical linkage is functional;

a link moving means for moving said link element between the interrupted position and the functional position, said moving means being normally biased to move said link element to and hold said link element in the functional position; and

a remotely controlled actuating means for actuating said link moving means including (a) a transmitter means for selectively transmitting a disabling signal, said transmitter means being designed to be carried by the operator of the firearm, and (b) a receiver means located adjacent said link moving means for receiving the signal from said

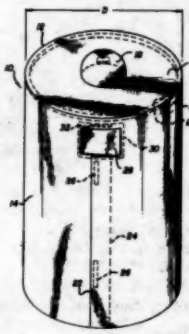
transmitter means and for operating said link moving means.

4,682,436

FOLD-AWAY BLIND

John R. Ritson, 359 Friendship Cir., Winston-Salem, N.C. 27106

Filed Jan. 7, 1986, Ser. No. 816,784
Int. Cl.[4] A01M *31/02*
U.S. Cl. 43—1 **11 Claims**



1. A portable blind for camouflaging a person while in the wilderness, said blind comprising:

a substantially circular flexible spring frame having a first diameter when said blind is in a utilization configuration, said frame being twistable into substantially circular segments having diameters less than said first diameter and which are placeable proximate one another when said blind is in a storage configuration;

means for supporting said spring frame upon a head of a person comprising a cap which is wearable on a person's head and a circular top, said cap having a discontinuous band with connection means at end portions of said band whereby said connection means facilitates adjustment of said cap to various head sizes, said top having an opening proximate its center sufficiently large to accommodate said cap therein, said cap being attached to said top at said opening, said cap and said top being attached along a portion of said band other than said end portions, the outer circumference of said circular top being attached to said circular frame; and,

a flexible side wall attached to said frame, said side wall extending downwardly from said frame and spaced apart from a person when said blind is in said utilization configuration.

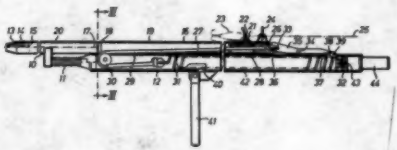
4,682,437

FISHING DEVICE

Magnus W. Akerberg, Storgatan 77, S-576 00 Vetlanda, Sweden

PCT No. PCT/SE84/00273, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/01075, PCT Pub. Date Feb. 27, 1986
PCT Filed Aug. 9, 1984, Ser. No. 852,956
Int. Cl.[4] A01K *91/02*
U.S. Cl. 43—19 **12 Claims**

1. Fishing device comprising a rod (**10, 16**) with a coiling or spinning reel (**61**) and with a guide extending along the rod, and a driving slide (**26**) guided by the guide, for carrying along a lure (**23**) on a line (**25**) running out from the coiling or spinning reel, and projecting means (**26, 27, 31**) with a rubber cord (**27**) secured to the driving slide, said cord being stretched between the driving slide and a point (**30**) spaced in front of the rear end of the guide, when the driving slide is displaced to the rear end of the guide where the driving slide can be arrested by holding means (**33, 35**),for chocklike displacement of the driving slide by means of the stretched rubber cord from the rear end of the guide towards said point when the driving slide is released from the holding means, the lure being projected and the line being withdrawn from the coiling or spinning reel, characterized in that the guide is arranged in the rod (**10, 16**) proper with said point (**30**) located between the ends of the



guide and that a carriage (**21**) for supporting the lure (**23**) is arranged as a separate element displaceable in the guide, to be carried along in front of the driving slide (**26**) at the displacement thereof under the bias of the stretched rubber cord (**27**) and to continue by inertia towards an abutment (**15**) arranged at the free end of the rod, at termination of the movement of the driving slide at said point.

4,682,438

FIGHTING CHAIR AND ROD HOLDER

Martin Arrow, Hampton Bays, N.Y., assignor to Sanity Marine Products, Hampton Bays, N.Y.

Filed Nov. 17, 1986, Ser. No. 931,424
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 **9 Claims**

1. An apparatus for holding a fishing rod comprising:

a receiver for receiving the butt of a fishing rod;

means to allow said receiver to move forward and back and from left to right; and,

rotational means mounted in said rod receiver for engaging a slot in the butt of said fishing rod and for permitting said rod to rotate around its long axis while supported in said receiver.

4,682,439

FISHINGLINE GUIDE FOR FISHING ROD

Koi Inoue; Youki Go, and Yoshihiro Naeki, all of Tokyo, Japan, assignors to Daiwa Seiko Inc., Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,515
Claims priority, application Japan, Mar. 19, 1984, 59-52879
Int. Cl.[4] A01K *87/04*
U.S. Cl. 43—24 **4 Claims**

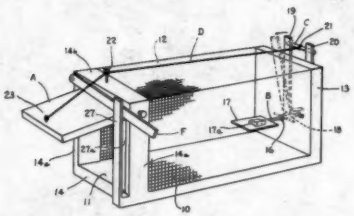
1. A fishing guide for a fishing rod, comprising:

an intermediate-layer ring made of a thermoplastic synthetic

resin in which reinforcing fibers are mixed, said intermediate-layer ring being formed integrally between an inner ring made of a hard, abrasion-resistant material, such as a metal or ceramics, and a metallic outer ring, and

inclined supporting parts and installing parts continuously formed integrally on the lower region of said intermediate-layer ring on both sides in such a manner that said inclined supporting parts and said installing parts securely encompass at least a portion of said outer ring, as well as in such a manner that said supporting parts do not extend over the entire outer circumferential surface of said intermediate-layer ring lower region.

4,682,440
ANIMAL TRAP
Robert F. Hunter, 119 Bowie St., Abbeville, S.C. 29260
Filed Dec. 17, 1986, Ser. No. 942,616
Int. Cl.[4] A01M *23/18*
U.S. Cl. 43—61 **4 Claims**



1. A small animal trap having a cage with a bottom, a top, a back, an open front and sides joining the top, bottom and back, said small animal trap comprising:

a trap door hingedly affixed to the top of the cage at the front thereof, said trap door having a front bottom edge;

a pair of upright posts carried exteriorly of the back of the cage;

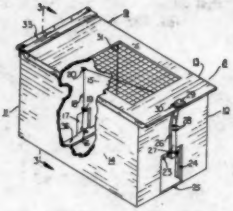
a lever pivotally mounted in the back of said cage at the center of the lever and balanced therein, said lever having a first end in the cage with a tray thereon for bait and a spaced opposite second end movably positioned between the pair of posts;

a trip rod extending between said first pair of posts;

a cord having a first end affixed adjacent the front bottom edge of said trap door and a spaced opposite second end affixed to said trip rod; and

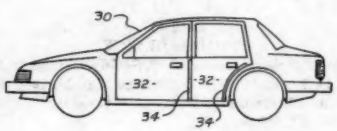
linkage means moved responsive to movement of said opposite second end of said lever dislodging said trip rod from between said posts.

4,682,441
ANIMAL TRAP
William A. Straver, 3540 Vienna Dr., Aptos, Calif. 95003
Filed May 14, 1986, Ser. No. 863,005
Int. Cl.[4] A01M *23/20*
U.S. Cl. 43—61 **6 Claims**



1. An animal trap for any size animal, comprising an enclosure of suitable dimensions for the animal desired to be captured, consisting of a floor, two side walls, a rear wall, and a front wall with entrance opening; a top, closing lid hingedly attached to the rear wall, a front, sliding trapdoor, and a dividing partition with bait opening, dividing the trap into two compartments, a front entrance compartment and a smaller rear bait compartment; a triggering mechanism entirely contained within the trap, comprised of a strand of string, wire or other suitable material stretched vertically across the bait opening and attached by a loop to a pin at the bottom of the bait opening in such a manner that the animal cannot reach the bait in the bait compartment without disturbing the strand by either biting through it or dislodging the loop from the pin, with the other end of the strand guided through a keeper, hook or eyelets along the face of the dividing partition and along the bottom side of the lid to the trapdoor; a trapdoor suspended from the strand and inserted into channels on either side of the entrance opening so as to allow it to slide downward when the tension on the strand is released by the animal severing or dislodging the strand from the pin, closing the entrance to the trap.

4,682,442
DOOR EDGE GUARD AND METHOD
Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.
Filed Mar. 4, 1986, Ser. No. 836,041
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.[4] B60J *5/00*
U.S. Cl. 49—462 **20 Claims**



1. In combination with the trailing edge of a swinging closure, a self-retaining insulating metal edge guard fitted onto said trailing edge comprising an elongate metal channel having in transverse view inner and outer legs extending from a generally semi-circular base, said inner and outer legs serving to apply self-retention forces to opposite sides of said trailing edge, said channel being formed from a metal strip of uniform thickness, non-metallic insulating material disposed on said metal channel in covering relation to said legs and base including a covering relation wherein direct contact of the metal of the channel with said trailing edge is prevented by said non-

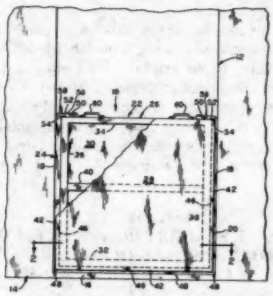
metallic insulating material, and ridges formed in said legs in at least one of said channel and said non-metallic insulating material to project laterally of said legs and thereby form laterally projecting protuberances, said ridges being disposed such that said legs apply self-retention forces to opposite sides of said trailing edge via said ridges, and in which said legs include straight segments immediately contiguous said ridges and located proximally in said legs relative to said ridges.

4,682,443

REMOVABLE SELF-CONTAINED FLOOD PROTECTION DEVICE AND METHOD OF INSTALLATION

Elmer W. Demo, 13723 Lower Huntington Rd., Roanoke, Ind. 46783

Filed May 21, 1986, Ser. No. 866,201
Int. Cl.[4] E05B *7/18*
U.S. Cl. 49—466 **4 Claims**



1. A removable, temporary flood protection device for installation in a doorway having a bottom doorsill and two spaced-apart door jambs upwardly extending from opposite ends of the doorsill which doorsill and door jambs cooperate to define a lower portion of a doorway opening above said doorsill and between said door jambs, said flood protection device comprising:

an inner core having a bottom beam, a top beam spaced apart and generally parallel side beams and, said beams rigidly interconnected in a generally rectangular configuration;

front and rear water resistant panels attached to and enclosing said bottom, top and spaced apart side beams, said panels having peripheral edges extending outwardly from said bottom beam and each of said side beams to define a continuous outwardly-opening channel extending along said bottom and sides of said core;

an outer resilient sealing means extending along and seated in said channel, which sealing means contacts said doorsill and door jambs to seal said lower portion of said doorway and secure said protection device in said doorway;

wherein said resilient sealing means is an inflatable tube which includes an inflation valve adjacent one of its opposite ends at said top of said core.

4,682,444

MICROFINISHING APPARATUS AND METHOD

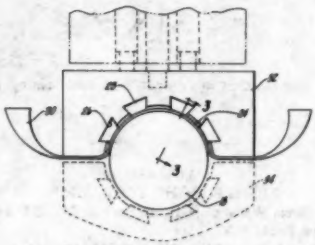
Norman R. Judge, Dewitt; Edward E. Judge, Jr., and Arthur G. Reiser, both of Lansing, all of Mich., assignors to Industrial Metal Products Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 608,201, May 7, 1984, abandoned. This application Oct. 8, 1985, Ser. No. 785,498
Int. Cl.[4] B24B *1/00, 29/04*
U.S. Cl. 51—154 **25 Claims**

1. A machine for microfinishing an outside curved surface of a workpiece, comprising:

abrasive coated tape,

a shoe assembly having means for holding said tape and having a rigid surface forming a predetermined surface shape related to a desired workpiece surface shape, said rigid surface contacting and pressing said tape into contact with said workpiece surface, said rigid surface defining an included angle between the boundaries of contact between said tape and said shoe of greater than 135° and less than 180° relative to the center of said curved workpiece surface,



means for causing relative rotation between said workpiece and said shoe assembly, and

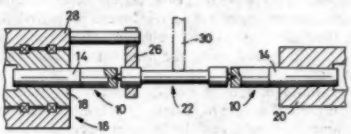
an arm which supports said shoe assembly such that relative movement between said workpiece surface and said tape occurs as said workpiece is rotated relative to said shoe assembly.

4,682,445

CERAMIC CENTER FOR MACHINE TOOLS

Katsuhiro Ono, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Jul. 29, 1985, Ser. No. 760,039
Claims priority, application Japan, Aug. 8, 1984, 59-166785
Int. Cl.[4] B24B *41/04*
U.S. Cl. 51—236 **19 Claims**



1. A ceramic center for a machine tool, said machine tool performing a machining or grinding operation upon a rotating workpiece, said ceramic center comprising a sintered ceramic mass having a bearing portion at a first axial end thereof for supporting said workpiece at one end on its axis of rotation, said sintered cearmic mass having a fracture toughness of at least 3.5 $MN/m^{3/2}$ at room temperature, and a density of at least 90% of theoretical density.

4,682,446

APPARATUS AND METHOD FOR SEATING CARBON BRUSHES IN MOTORS OR THE LIKE

Bobbie L. Woodall, P.O. Box 1025, and Jerry H. Nuttall, P.O. Box 272, both of, Springerville, Ariz. 85938

Filed Oct. 28, 1986, Ser. No. 923,892
Int. Cl.[4] B24B *1/00*; B24D *3/00*
U.S. Cl. 51—281 R **11 Claims**

8. A method of receiving the brushes of a motor or the like to conform the surface of said brushes to the contour of said motor commutator, comprising:

securing the sheet of seating material to said commutator,

said sheet having alternating strips of pressure sensitive adhesive and abrasive disposed thereon;

placing said brushes in contact with said seating material; and

rotating said commutator.

4,682,447

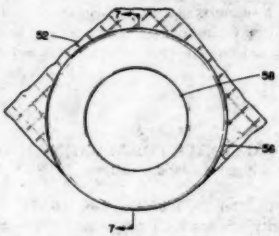
LIGHTWEIGHT TARPAULIN

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 640,714, Aug. 14, 1984, Pat. No. 4,580,372. This application Jan. 3, 1986, Ser. No. 815,975

Int. Cl.[4] E04B *1/34, 1/345;* A43C *5/00;* B65D *55/00*

U.S. Cl. 52—3 **5 Claims**



1. A lightweight tarpaulin for superposition over an object or on a surface area, said tarpaulin comprising:

(a) a tarpaulin body portion of a flexible sheet material constituted essentially of a fiber-reinforced polyethylene film, said sheet material having a plurality of apertures formed therein and spaced along the periphery of said body portion; and

(b) a plurality of flat, disc-shaped plastic grommets each constituted of a rigid high-density polyethylene, each said grommet having a circular central opening therein and being adhesively fastened to at least one surface of said flexible sheet material such that the circular opening of the grommet is in superimposed alignment with respectively one of said apertures in said sheet material.

4,682,448

SHELTER

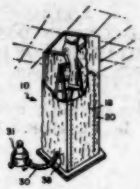
Brian J. Healey, Charlestown, Mass., assignor to Fiberlock Technologies, Inc., Cambridge, Mass.

Filed Mar. 21, 1986, Ser. No. 842,672

Int. Cl.[4] E04B *1/347;* E04H *15/02*

U.S. Cl. 52—63 **1 Claim**

1. A mobile isolation module in the form of a cubicle enclosure of rectangular, horizontal and vertical cross section comprising a bottom wall, a top wall and quadrilaterally-disposed side walls which collectively define a closed chamber, one of said side walls containing a rectangular opening for entrance into the chamber, a panel of corresponding rectangular configuration disposed in said opening, zipper fastener means connecting the panel within said opening to provide access through said opening to the enclosure and to seal the enclosure when in use, means providing an opening in the top wall for exit from the chamber at the top, comprising quadrilaterally-arranged panels formed in the top wall of triangular configuration, the adjacent sides of which are diagonal to the top and the apices of which meet at the center of the top, zipper fastening means joining the adjacent edges of the panels such as to enable variably disconnecting the adjacent edges of the panels to provide an opening at the top of adjustable size, vacuum generating means connected to the chamber through one side wall to enable lowering the pressure therein, a mobile platform, an adjustable frame comprised of quadrilaterally-disposed posts



fixed at their lower ends to the platform upon which the enclosure is disposed, said frame being adjustable heightwise to a height corresponding to the height of the ceiling and said side wall panels being comprised of flexible material of a sufficient length heightwise of the module to be extended by adjustment of the frame to the ceiling height and means for mobilizing the platform and, hence, the module, comprising casters mounted to the platform at the four corners.

4,682,449

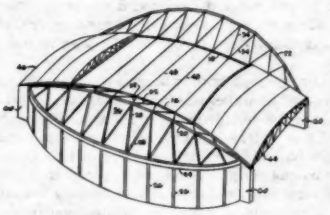
RETRACTABLE STADIUM ROOF SYSTEM WITH RECTANGULAR OPENING

Horst L. Berger, 18 Chestnut Dr., Hastings-on-Hudson, N.Y. 10706

Filed Sep. 30, 1986, Ser. No. 913,520

Int. Cl.[4] E04B *7/16*

U.S. Cl. 52—66 **1 Claim**



1. A retractable roof structure for covering a field having a first axis and a second axis comprising:

two tracks which in plan view are parallel to each other and to the first axis and in elevational view along the first axis are convex and form an arc of a circle;

two arches which in plan view are convex and circumscribe the tracks such that each track is along a chord of a respective arch, and in elevational view along the first axis also are convex but have curvatures greater than those of the tracks, to thereby extend above the tracks;

a substantially rigid, laterally extending edge ring which in plan view generally follows the arches and in elevational view along the first axis extends along chords of the arches and tracks;

a support for raising the edge ring above grade;

two sets of substantially rigid arch support struts which extend up from the edge ring to the respective arches;

two sets of track suspending cables which extend down from the arches to the respective tracks;

two fixed roof portions which extend from the edge ring to the respective tracks;

two retractable roof panels having runners which in plan view overlap the tracks and match the curvature of the tracks in elevational view along the first axis, wherein the roof panels are convex in elevational view along the second axis;

a set of tie cables extending between the two tracks; and

means for selectively moving the roof panels toward and away from each other along the tracks to thereby close or open the roof of the structure.

4,682,450

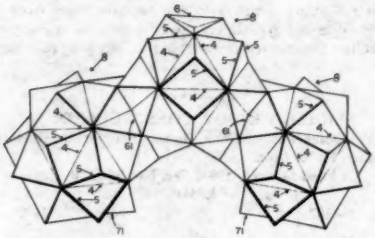
COMBINATE POLYHEDRA

Gary C. Diamond, 671 Landfair #9, Los Angeles, Calif. 90024

Filed Jul. 30, 1985, Ser. No. 760,541

Int. Cl.[4] C04B *1/32*

U.S. Cl. 52—81 **3 Claims**



1. A three dimensional, space enclosing structure or space enclosing, rigid structural framework comprising,

at least three six-sided polyhedrons,

said six-sided polyhedrons having six equal triangular sides,

said six-sided polyhedrons being formed of the joining of two four-sided polyhedrons,

said four-sided polyhedrons having an equilateral triangular base of edge length x and having three additional edges of length approximately 0.7x,

said three six-sided polyhedrons being joined to each other at least along one of their edges of length x,

one edge of length approximately 0.7x of two of said three polyhedrons being located in a coplanar orientation with each other.

4,682,451

PROTECTIVE COVER FOR WINDOW SILLS

Terence H. Hubble, New Malden, United Kingdom, assignor to P & H Enterprises Limited (Musical Products), New Malden, United Kingdom

Filed Mar. 14, 1986, Ser. No. 839,623

Claims priority, application United Kingdom, Mar. 18, 1985, 8506936

Int. Cl.[4] E06B *1/70*

U.S. Cl. 52—97 **17 Claims**

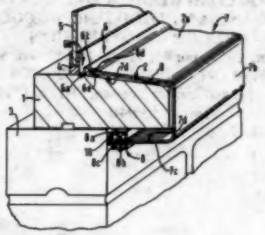
1. A protective cover for a window sill comprising:

an elongate keeper strip member fixedly mountable along and on or immediately adjacent an upper surface of the sill where the upper surface meets a superposed structural member;

an elongate anchor strip member fixedly mountable against or immediately adjacent an undersurface of the sill where the undersurface meets a subjacent structure, the keeper strip member and the anchor strip member each including a recess along the length thereof which, in use, faces forwardly of the sill;

an elongate cover member having upper, front, and lower walls shaped so as to embrace the exposed portion of the sill, said upper and lower walls having respective free edge portions; and

detent means formed on said free edge portions of said upper and lower walls for maintaining said free edge portions in



engagement with said keeper strip member and said anchor strip member, respectively.

4,682,452

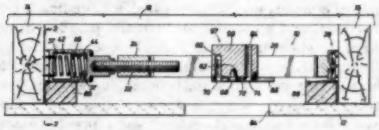
HANGER ASSEMBLY

Clarence E. Propp, Rt. 3, Box 490, College Station, Tex. 77840, and J. Russell Kerr, 19 Cargill La., Bryan, Tex. 77801

Filed Oct. 18, 1985, Ser. No. 788,952

Int. Cl.[4] E04H *12/34*; F16M *13/00*

U.S. Cl. 52—118 **2 Claims**



1. In a hanger assembly for supporting a load such as an electrical fixture from ceiling joists, a fixture support unit comprising:

a pair of parallel support beams having a slot between same, said support beams being positioned with an opening facing the direction of said load;

a T-shaped slide bar having a horizontal portion resting upon said parallel beams, said slide bar further having a plurality of internally threaded cylindrical holes passing therethrough;

a retaining plate having a plurality of holes corresponding to said plurality of threaded cylindrical holes;

a retaining screw passing through one of said holes in said retaining plate and into a threaded hole in said slide bar for securing said slide bar at a selected position within said slot;

an electrical box;

a threaded support rod for adjusting said electrical box to a proper height, said support rod being inserted through a second hole of said plurality of retaining plate holes, threadedly engaging a second corresponding hole of said plurality of threaded cylindrical holes, and being adjusted to said proper height;

a first lock nut for securing said support rod at said proper height;

a threaded anti-torque rod for countering any rotational forces acting on said electrical box caused by said fixture, said anti-torque rod being inserted through a third hole of said plurality of retaining plate holes, threadedly engaging a third corresponding hole of said plurality of threaded cylindrical holes, and being adjusted to said proper height;

a second lock nut for receiving said anti-torque rod at said proper height;

means for attaching said electrical box to said support and anti-torque rods; and

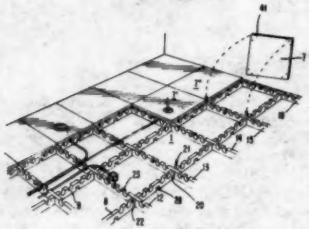
means for attaching said fixture to said electrical box.

4,682,453

FLOOR CONSTRUCTION SUITABLE FOR INSTALLATION IN ROOMS CONTAINING SWITCHGEAR, COMPUTERS, AND LIKE ELECTRICAL APPARATUS, AND A METHOD FOR PRODUCING SUCH A FLOOR CONSTRUCTION

Klas Holmgren, Tulegatan 45, 113 53 Stockholm, Sweden

Filed Oct. 1, 1985, Ser. No. 782,730
Claims priority, application Sweden, Oct. 2, 1984, 8404923
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—126.2 **8 Claims**



1. A floor construction, suitable for rooms having a supporting foundation and containing electrical equipment, comprising at least one right-angled slab having slab edge portions, a plurality of mutually parallel, elongated, longitudinally extending first joists and a plurality of mutually parallel, elongated second joists which are located at right angles to the first joists, said first and second joists defining at least one quadrangular cavity, said first and second joists having upper edge portions adjacent each cavity, said right-angled slab covering said cavity so as to form a floor surface, each slab supported along said slab edge portions by said upper edge portions of said first and second joist sections, the first joists provided with a plurality of first recesses spaced at a predetermined distance apart along said first joists; the second joists provided with a plurality of second recesses spaced at a predetermined distance apart along said second joists; said first and second joists each provided with third recesses for channeling pipes, electrical cables and the like, said first and third recesses reducing flexural resistance of said first joists so that said first joists are adapted to rest conformingly against a support foundation, the second and third recesses reducing flexural resistance of the second joists so that said second joists are adapted to rest conformingly agaist a supporting foundation, said first and second recesses adapted to mutually co-act so as to locate the upper edge portion of the first joist and the upper edge portion of the second joist in a common plane; at least one slab provided with means for locking the slab with said joists so that horizontal movement of the slab in said common plane is prevented, whereby said floor-structure may be locked together.

4,682,454

STANDING SEAM ROOF ASSEMBLY COMPONENTS

Harold G. Simpson, Mustang, and Leo E. Neyer, Edmond, both of Okla., assignors to Harold Simpson, Inc., Oklahoma City, Okla.

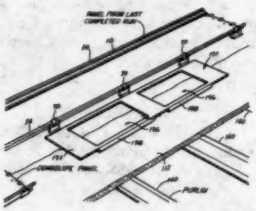
Continuation-in-part of Ser. No. 745,320, Jun. 14, 1985. This application Feb. 24, 1986, Ser. No. 832,748
Int. Cl.[4] E04B *7/18*
U.S. Cl. 52—200 **9 Claims**

1. A method of installing a utility opening assembly in a building roof assembly in which standing seam roof panels interlocked in side by side disposition over roof support structural members, comprising:

placing a backup frame on the roof support structural members at a selected access opening location, the backup frame having at least one access opening therein;

installing a roof panel over the backup frame in the progressive installation of the roof assembly by interconnecting the roof panel with adjacently disposed roof panels;

removing a portion of the overlying roof panel at the access opening of the backup frame; and



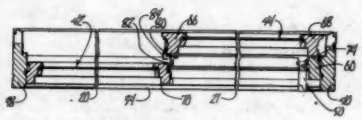
securing a utility member to the backup frame over the access opening to sealingly cover the access opening and to unitize the secured member to the overlying roof panel.

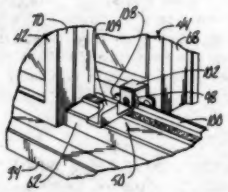
4,682,455

SLIDING WINDOW CONSTRUCTION

Marlo V. Klompenburg, Pella, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed Oct. 16, 1984, Ser. No. 661,380
Int. Cl.[4] E05D *15/20*
U.S. Cl. 52—207 **41 Claims**





1. A window assembly in a window frame, said frame including a head, a sill, and opposite jambs, said assembly comprising: first and second sashes each having interior and exterior surfaces, a top, a bottom, and opposite first and second sides extending between said top and said bottom;

said first sash being laterally movable within said window frame between a closed position and an open position wherein said first sash is substantially in a non-planar position relative to said second sash;

track means extending along one of said sill or head of said window frame;

first track follower means connected to one of said top or said bottom of said first sash adjacent said first side thereof and cooperating with said track means for supporting and guiding said first sash during lateral movement between said open and closed positions; and

said track means having an opening therein for releasing said track follower means for cooperation therewith only when said first sash is in said open position such that said first sash is pivotal about a vertical axis adjacent said second side thereof between said open position and a maintenance position.

4,682,456

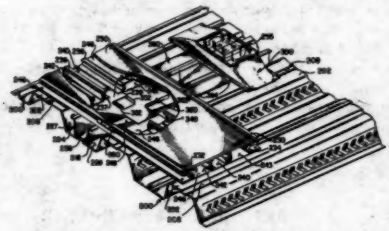
CELLULAR FLOORING SYSTEM AND METHOD OF USING SAME

Thomas W. Hartman, Pittsburgh, and Thomas G. Ryan, Bethel Park, both of Pa., assignors to Cyclops Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 517,366, Jul. 26, 1983, Pat. No. 4,593,506, which is a continuation-in-part of Ser. No. 441,052, Nov. 12, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 829,911

Int. Cl.[4] E04B 5/48

U.S. Cl. 52—221 8 Claims



1. In a cellular flooring system of the type having a plurality of longitudinally extending parallel conduits provided on a first horizontal level, at least a portion of said conduits being formed by portions of corrugated metal decking sheets, and an overlying trench unit having a length and supported by said decking sheets on a second horizontal level disposed vertically above said first level, said trench unit having a plurality of adjacent parallel passageways crossing over and extending transversely with respect to said conduits and creating a region where the passageways and conduits are juxtaposed the improvement which comprises:

(a) said trench unit having a base portion extending substantially the length of the trench with a generally rectangular opening therein extending substantially throughout the region where the passageways and conduits are juxtaposed to allow for communication and for substantially unrestricted vertical access between the passageways and conduits and;

(b) separate isolating means in the form of a substantially flat plate member adapted to be positioned within the rectangular opening and to be removably attached to said trench unit in a substantially coplanar relationship with said base portion said isolating means having a shape whereby said isolating means partially covers said rectangular opening and acts as a complete isolating barrier between some, but not all, of the juxtaposed passageways and conduits and said isolating means provides at least one uncovered portion of said rectengular opening to allow for isolated access between at least one passageway and at least one conduit.

4,682,457

OPEN OFFICE LANDSCAPE SYSTEM

Richard O. Spencer, 18 Viejo, Irvine, Calif. 92714

Filed Aug. 15, 1985, Ser. No. 766,099

Int. Cl.[4] E04H 1/00

U.S. Cl. 52—239 8 Claims

1. An open office partition system comprising:

a panel receiving base having means for leveling a panel receiving channel of said receiving base and having a plurality of projecting pins formed in said panel receiving channel;

a partition wall received upon said projecting pins formed in said panel receiving channel attaching said partition wall to said receiving base, said partition wall consisting of a plurality of modular panels, each of which comprises:

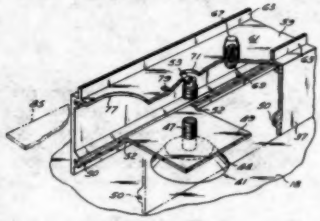
a lower panel retention channel having a first and a second end,

a first vertical panel wall support channel attached to and extending from said first end of the lower panel retention channel,

a second vertical panel wall support channel attached to and extending from said second end of the lower panel retention channel, said first and said second vertical support channels each having a laterally open vertical chase formed therein,

a top raceway channel attached to and connecting said first and said second vertical support channels at the extending end thereof, said raceway channel having an open top electrical raceway formed therein,

at least one intermediate brace attached to and extending from said vertical support channel to said second vertical support channel, and



an outer panel covering attached to the channel members forming an outer skin for the modular panel;

a plurality of connection clips for connecting vertical support channels of adjacent modular panels at preselected angles with respect to one another such that said laterally open vertical chases form closed vertical passageways between adjacent panels, the modular panels connected in a manner maintaining the continuity of said open raceway channel permitting an electrical network to be retained therein; and

an electrical network received within at least a portion of said top electrical raceway and said vertical chase,

whereby a continuous electrical network may be created as part of the partition wall by the selective placement of the modular panels, and said wall placement may proceed subsequent to a leveling of the base receiving channel.

4,682,458

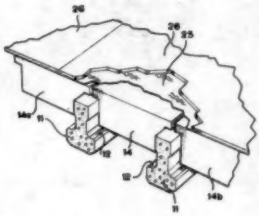
DRY LAID FLOORS

Ian H. Sparrow, Bottesford, England, assignor to Trent Jetfloor Limited, Hoveringham, England

Continuation of Ser. No. 546,363, Oct. 27, 1983, abandoned. This application Jan. 29, 1986, Ser. No. 824,296

Int. Cl.[4] E04C 1/00

U.S. Cl. 52—309.8 8 Claims



1. A dry-laid floor comprising a plurality of elongated sup-

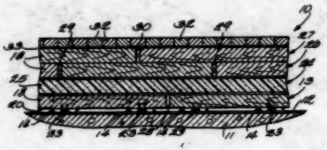
port beams arranged in parallel, spaced apart relationship in a horizontal plane, the distance between adjacent beams being not more than about 900 mm, prefabricated blocks of foamed polystyrene resting on said beams and bridging the gaps between adjacent ones of said beams, the thickness of each said block of foamed polystyrene extending above said beams being not less than about 100 mm so as to form a substantially rigid load bearing surface that spans the spaces between said beams, said blocks of foamed polystyrene forming a substantially flat continuous upper surface suitable for supporting hard flooring surface, and a hard flooring surface resting on and supported by said blocks of foamed polystyrene.

4,682,459

FLOORING SYSTEM

Debra A. Stephenson, 210 Crystal Ave., Crystal Falls, Mich. 49920

Filed Apr. 15, 1986, Ser. No. 852,242
Int. Cl.[4] E04F *13/08*
U.S. Cl. 52—390 **18 Claims**



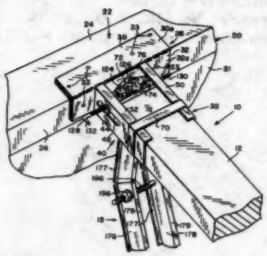
1. A flooring system comprising a foundation, a first substantially rigid layer including a plurality of elongate sheets arranged in a first plurality of parallel courses overlying said foundation, a plurality of resilient pads affixed to said first elongate sheets and disposed between said first rigid layer and said foundation, a layer of resilient material overlying said first rigid layer, a second substantially rigid layer including a second plurality of elongate sheets arranged in a second plurality of parallel courses over said resilient layer, a third substantially rigid layer including a third plurality of elongate sheets arranged in a third plurality of parallel courses over said second rigid layer, and a plurality of floorboards overlying said third rigid layer.

4,682,460

OPEN WEB STRUCTURAL SUPPORT MOUNTING BRACKET AND LENGTH ADJUSTABLE WEB MEMBER

William R. Reetz, Boise, Id., assignor to Trus Joist Corporation, Boise, Id.

Filed Apr. 16, 1986, Ser. No. 852,732
Int. Cl.[4] E04H *12/18*; E04C *3/292*
U.S. Cl. 52—632 **18 Claims**



1. A structural support apparatus of the open web type comprising,

an upper chord member;

a lower chord member;

a plurality of web-members interconnecting said chord members and including at least one length adjustable end web member;

mounting bracket means for mounting the top of the upper chord member at substantially the same level as an end support to which the bracket means is attached, said bracket means extending laterally of said upper chord member length and adapted to be secured at the top of said end support for transferring load from the structural support apparatus to the end support;

said bracket means including outwardly extending chord receiving means for receiving and supporting an end of the upper chord member whereby said bracket means enables the top of the structural support apparatus to be mounted flush with the top of the end support, said receiving means being adapted to receive different length upper chord members;

connection means for connecting the bracket means to said length adjustable end web member; and

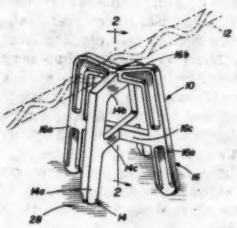
adjustment means for adjusting the length of said end web member by an adjustment movement transverse to said length.

4,682,461

SUPPORT FOR REINFORCING BAR

Billy G. Sizemore, West Carrollton, Ohio, assignor to Winston C. Sizemore, Franklin and Charles P. Sizemore, West Carrollton, both of, Ohio, part interest to each

Filed Mar. 31, 1986, Ser. No. 846,036
Int. Cl.[4] E04C *5/16*
U.S. Cl. 52—689 **5 Claims**



1. A chair support structure for use in supporting a reinforcing bar during a concrete pouring procedure comprising smaller and larger plastic elements each shaped substantially as a letter A with diverging legs, an upper cross member, and a lower cross member, the smaller element being adapted to fit through an opening defined between the cross members of the larger element in a relatively tilted position, and the respective cross members being formed with complementary central notches whereby the smaller element may be swung laterally into vertical position relative to the larger element with the respective notches being interengaged to lock the elements together in a cruciform configuration with the lower cross members preventing the legs from spreading outwardly when supporting a weight.

4,682,462

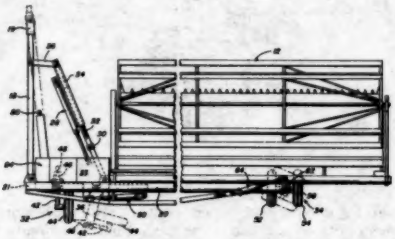
SWATHER WITH SWINGING HITCH

Gerald T. Johnson, Sr., R.R. Box 76, Kulm, N. Dak. 58456

Filed Oct. 4, 1985, Ser. No. 784,237
Int. Cl.[4] A01B *73/00*
U.S. Cl. 56—228 **11 Claims**

1. A pull-type agricultural implement such as a swather having an elongate frame mounting a power-driven work member, such as a swather reel, a movable first wheel assembly adjacent one end of the frame, a movable second wheel assembly adjacent the other end of the frame, an adjustable hitch

assembly at said one end of the frame for changing the configuration of the implement in relation to a towing vehicle as between a working field position wherein the implement is pulled in a direction substantially perpendicular to the length of the frame, and a transport position wherein the implement is pulled in a substantially lengthwise direction, and power means for moving the respective wheel assemblies between field and transport positions, the hitch assembly comprising a hitch pole pivotally connected at one end of the pole to a part of the frame at said one end thereof, the hitch pole having means at its other end for connection to a towing vehicle, a telescoping assembly pivotally interconnected between the frame and the hitch pole, a first hydraulic cylinder for providing telescopic extending and retracting movements of the telescoping assembly effective to adjust the angle of the hitch pole relative to the frame as between field and transport positions, the power



means comprising a second hydraulic cylinder for moving the first wheel assembly between the field and transport positions, and a third hydraulic cylinder for moving the second wheel assembly between the field and transport positions, said first wheel assembly comprising a castering wheel and locking means for preventing the wheel from castering when in the field position, said castering wheel comprising a bracket mounted for pivotal movement on the frame under control of the second cylinder, a wheel-carrying shaft rotatably mounted in the bracket, said locking means comprising a latch element on the shaft, and a complimentary latch element on the frame, the respective latch elements interengaging when the bracket is pivoted to field position to hold the shaft against rotation, and the elements disengaging when the bracket is pivoted to transport position to allow rotation of the shaft and castering of the wheel.

4,682,463

APPARATUS FOR FORMING AND ATTACHING A FLEXIBLE FOIL SEALING DISK

Istvan Foldesi, Laval, Canada, assignor to Montreal Milling Cutter Company, Canada

Filed Sep. 3, 1985, Ser. No. 771,933
Int. Cl.[4] B65B 7/28
U.S. Cl. 53—298 **3 Claims**

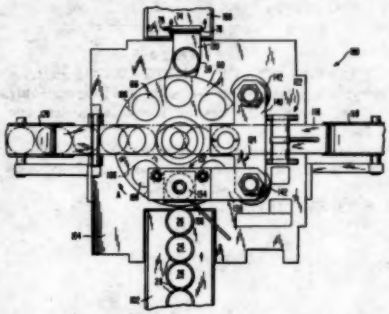
1. Apparatus for forming and attaching a flexible foil sealing disk to an open mouth container, said apparatus comprising:

means for feeding a continuous web of flexible metal foil from a supply reel past a flexible foil sealing disk forming station;

a die cutting assembly at said flexible foil sealing disk forming station, said die cutting assembly including a cutting die and a die plate, said cutting die and said die plate being operable to form said flexible foil sealing disks from said foil web;

a rotatable wheel having a plurality of spaced openings, each of said spaced openings receiving a flexible foil sealing disk formed at said disk forming station and transferring said formed flexible foil sealing disks from said die cutting assembly to a heat sealing station, said die cutting assembly and asid heat sealing station being positioned adjacent each other around the periphery of, and above said rotatable wheel;

reciprocable heat sealing head at said heat sealing station, said heat sealing head passing through each of said spaced openings in said rotatable wheel, heating a heat activated adhesive film on said flexible foil sealing disk, and transferring said flexible foil sealing disk from said rotatable wheel to said open mouth container to tack-adhere said flexible



foil sealing disk to said container mouth said heat sealing head and said cutting die being connected for concurrent reciprocation; and

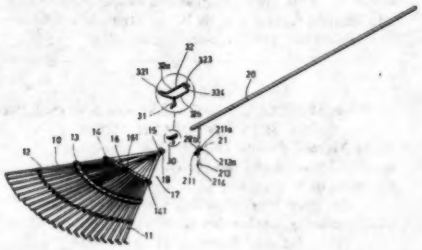
spaced, rotatable star wheels coaxially mounted with, and rotating with said rotatable wheel for delivering containers to said heat sealing station and for removing said containers and attached flexible foil disks from said heat sealing station.

4,682,464

RAKE

Han-Ching Sun, No. 43, Ta-An Road, Tien Chung Chen, Changhua Hsien, Taiwan

Filed Jan. 21, 1986, Ser. No. 823,093
Int. Cl.[4] A01D 7/00
U.S. Cl. 56—400.17 **4 Claims**



1. An improved rake comprising:

a drag portion having a plurality of prongs which is set transversely at one end and convergent at the other end of said drag portion;

a clamping bar provided on said drag portion at said convergent end for clamping said plurality of prongs, wherein said clamping bar further includes a pin at its center;

a handle portion connecting to said convergent portion of said drag portion;

a fork member provided at one end of said handle portion including a forked end which is engaged with said pin of said clamping bar; and

an engaging means provided between said drag portion and said handle portion for connecting said two portions,

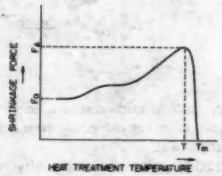
including a clip member for clipping and a U-shaped member for holding said convergent end of said drag portion with said handle portion, wherein said clip member is constituted by a single length of wire which is formed with two leg portions with two inwardly bent portions at one end of said clip member and a curved portion which is extended upward at an angle to the plane of said two leg portions at the other end of said clip member.

4,682,465

FALSE-TWIST TEXTURED YARN OF POLYAMIDE

Teiryo Kojima; Heiichiro Matsuda, and Masaru Tokizane, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,305
Claims priority, application Japan, Dec. 7, 1983, 58-229936
Int. Cl.[4] D02G *3/02*
U.S. Cl. 57—247 **5 Claims**



1. A false-twist textured yarn composed of a continuous polyamide filament yarn, characterized in that the maximum value F (g) of the shrinkage force under dry heat and a heat treatment temperature T (°C.), at which said maximum shrinkage force value F is attained, are defined by the following equations:

$$0.20\ g/D \geqq F/D \geqq 0.08\ g/D, \text{ and}$$

$$TM \geqq T \geqq Tm - 25$$

wherein D is the titre of the textured yarn represented by denier, and Tm is the melt-breakage temperature of said polyamide filament represented by °C. and that the crimp recovery CR of the yarn is 15% or more.

4,682,466

DEVICE TO DOFF YARN PACKAGES ON RING SPINNING MACHINES

Roberto Meroni; Danny Lant, both of Pordenone; Fabio Lancerotto, Milan, and Umberto Gerin, Pordenone, all of Italy, assignors to S. Bigagli & C. SpA, Prato, Italy

Filed Mar. 20, 1986, Ser. No. 841,782
Claims priority, application Italy, Mar. 26, 1985, 83349 A/85
Int. Cl.[4] D01H *9/04, 9/02, 9/18*
U.S. Cl. 57—274 **10 Claims**

1. A device to doff yarn packages from a ring spinning machine having a spindle shaft, and automatically replace yarn packages with empty tubes, comprising:

a conveyor for supplying empty tubes and removing yarn packages, located above the spindle shaft;

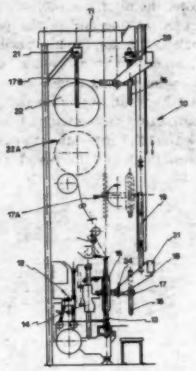
a horizontal shaft;

a gripper rotatably mounted on said horizontal shaft, comprising a first element to engage said tubes and a second element to engage said yarn packages;

means for rotating said gripper 180° about the horizontal shaft in order to bring either of the engagement elements in alignment with the spindle shaft of said ring spinning machine;

a first position where said gripper can either remove yarn packages from or deposit empty tubes on the spindle shaft of the ring spinning machine;

a second position located above the first engagement position where said gripper can either deposit yarn packages onto the conveyor or engage empty tubes from the conveyor; and



means for moving said gripper between said upper engagement position and said lower engagement position;

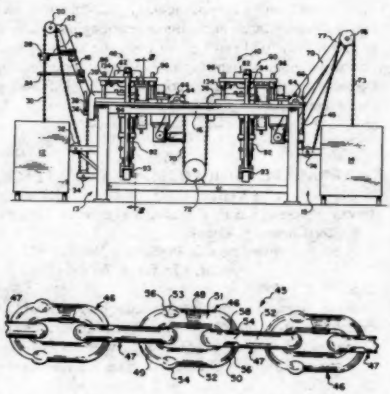
wherein during operation, said device is located above the spindle shaft of the ring spinning machine.

4,682,467

CHAIN FORMING METHOD AND APPARATUS

Ronald G. Waltemyer, and Royce L. Brown, both of York, Pa., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 13, 1985, Ser. No. 701,851
Int. Cl.[4] B21L *15/00*
U.S. Cl. 59—30 **26 Claims**



1. A method for producing oriented, one-way links from a stock chain of the type including oval shaped links each having first and second rounded ends and parallel spaced straight side sections formed in a continuous loop having an interior space and an exterior surface, said method comprising the steps of:

moving the chain to a first forming station;

forming protuberances in each straight side section adjacent the first end of at least a single first link at said first station, the protuberances extending laterally outwardly from the exterior surface of at least one first link;

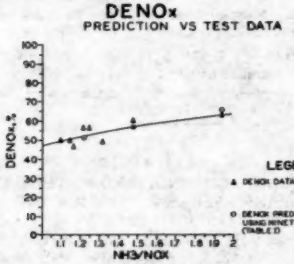
moving the chain to a second forming station;
rotating the chain;
forming protuberances on each straight side section adjacent the first end of at least a single second link orthogonal to the first link at said second station the protuberances extending laterally outwardly from the exterior surface of at least one second link; and
repeating the above step until all links of the chain have protuberances formed thereon.

4,682,468

NON-CATALYTIC METHOD FOR REDUCING THE NO EMISSIONS OF GAS TURBINES

Anthony M. Dean, Hampton; Anthony J. DeGregoria, Flemington; James E. Hardy, Lebanon, and Richard K. Lyon, Pittstown, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 550,398, Nov. 10, 1983, Pat. No. 4,507,269. This application Mar. 22, 1985, Ser. No. 715,120
Int. Cl.[4] F02C *7/00*
U.S. Cl. 60—39.02 **8 Claims**



1. In a gas turbine which operates at superatmospheric pressures and which contains: (a) a combustor in which primary air and fuel are introduced, (b) combustion effluents at a temperature from about 975° K. and 1600°K. and containing NO and at least 0.1 volume percent oxygen, (c) a source of secondary air for diluting and cooling the combustion effluents, and (c) turbine blades; the improvement which comprises: (i) reducing the total amount of NO emitted from the gas turbine by contacting the combustion effluents prior to passage through the turbine blades with ammonia; (ii) replacing at least a portion of the secondary air with inert gas; and (iii) determining the temperature of the combustion effluent, the residence time, and the amount of ammonia employed by the solution of a set of simultaneous equations derived from the kinetic model of Table I hereof.

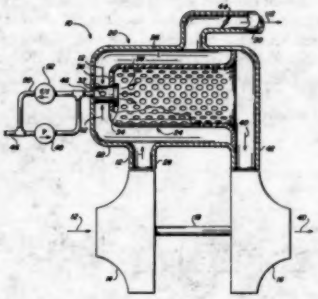
4,682,469

COMPRESSOR POWER UNIT FUEL FLOW CONTROL

Frederick C. Maynard, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 4, 1985, Ser. No. 784,400
Int. Cl.[4] F02C *9/26*
U.S. Cl. 60—39.06 **8 Claims**

1. A method of controlling fuel flow through a nozzle positioned in a combustor receiving pressurized combustion air from a source thereof, said method comprising the steps of:
(a) supplying fuel at an essentially constant pressure to the nozzle; and
(b) altering the fuel pressure drop across the nozzle solely by varying the air pressure within the combustor to thereby selectively vary the fuel flow through the nozzle,
the combustor having a liner adapted to receive fuel discharged from the nozzle and pressurized combustion air, and wherein said altering step (b) is performed by varying the air pressure within the liner in a manner maintaining the absolute pressure ratio of the fuel supply pressure to



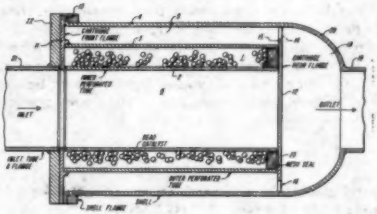
the liner interior pressure within a predetermined range from about 1.1 to about 1.3.

4,682,470

CATALYTIC CONVERTER FOR EXHAUST GASES

Gerald Shaff, Chelsea, Mich., assignor to Echlin, Inc., Branford, Conn.

Continuation of Ser. No. 601,249, Apr. 17, 1984, abandoned. This application Feb. 3, 1986, Ser. No. 825,202
Int. Cl.[4] F01N *3/28*
U.S. Cl. 60—299 **5 Claims**



1. A catalytic converter comprising an annular catalyst bed containing catalyst beads and defined by coaxial inner and outer louvered tubed, an outer shell coaxial with said catalytic bed, means forming a gas flow path through said converter wherein said catalyst bed is interposed between an upstream flow portion and a downstream portion of said gas flow path with said upstream portion defined in part by the inner surface of said inner louvered tube and said downstream portion defined in part by the outer surface of said outer louvered tube and the inner surface of said outer shell, and means forming an outlet in said downstream portion having a cross-sectional area that is no greater than the cross-sectional area of said upstream portion, said outlet means comprising a flange that defines the rear wall of said catalyst bed and projects radially beyond said outer louvered tube, toward said outer sheet, and into said downstream portion, thereby constricting said flow path, said flange including a plurality of radial tabs that engage the inner surface of said shell, thereby further constricting and defining the flow path between the flange and the outer shell.

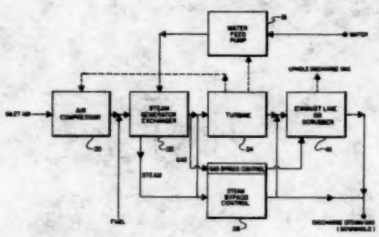
4,682,471
TURBOCOMPRESSOR DOWNHOLE STEAM-GENERATING SYSTEM

William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 798,350, Nov. 15, 1985, abandoned, which is a continuation of Ser. No. 591,718, Mar. 21, 1984, abandoned. This application Sep. 11, 1986, Ser. No. 906,680

Int. Cl.[4] F01K *21/04*; E21B *36/00*

U.S. Cl. 60—649 2 Claims



1. A downhole steam-generating system comprising:

an air compressor;

a steam generating unit, including:

a combustor for combusting fuel with the compressed air from said compressor thereby producing combustor exhaust products; and

steam conversion means, in indirect heat-exchange relationship with said combustor, for converting water which is fed into said steam-conversion means into steam;

a turbine which is rotated by said combustor exhaust products and steam from said steam-generating unit, the rotational motion of the turbine being mechanically coupled to the air compressor to drive said air compressor; and

control bypass means associated with said steam generating unit and turbine for regulating the relative amounts of the combustor exhaust product and steam delivered to said turbine from said steam generating unit,

wherein said air compressor and turbine form an integral turbocompressor unit, said turbocompressor unit, steam-generating unit and control bypass means being located downhole during operation of the steam-generating system.

4,682,472
COUPLING DEVICE FOR TUBES, TUBULAR ELBOWS AND END PLATES OF THERMOELECTRIC DEVICES

Jean-Francois Huard, Pont-A-Mousson, France, assignor to Tunzini Nessi Entreprises d'Equipements, Rueil Malmaison, France

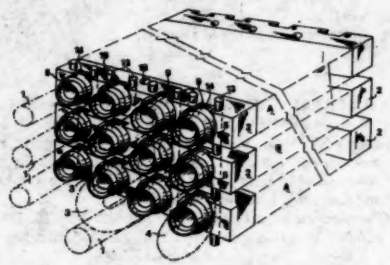
Filed Aug. 23, 1985, Ser. No. 768,713

Claims priority, application France, Aug. 27, 1984, 84 13330

Int. Cl.[4] F25B *21/02*; H01L *35/28*

U.S. Cl. 62—3 12 Claims

1. A coupling assembly for providing coupling between a tube, a tubular elbow and an end plate, in a thermoelectric device of the type comprising a plurality of thermoelements cooperating with heat exchangers comprising a plurality of tubes in alternate superimposed layers in which respective warm and cold fluids flow, at least one of said fluids being a liquid flowing through a said tube cooperating thermally with at least one thermoelement, said tubes being supported in said alternate superimposed layers by a said end plate located near each of the extremities of said tubes, the tubes extending through the end plates, said coupling assembly comprising a coupling member coupled to an extremity of each tube, and a tubular elbow member for providing connection between an extremity of a first said tube and an extremity of a second said tube, said elbow member being connected to the coupling member coupled to the first tube and to the coupling member coupled to the second tube, each said tube being received in a said coupling member and extending at least partially therethrough, said coupling member being received in a countersunk recess in said end plate and including a groove means in



the external surface thereof, and said coupling assembly further comprising means, comprising a pair of straight, elongate pins disposed in parallel relationship, for cooperating with said groove means of said coupling member to provide locking of said coupling member in said countersunk recess in said end plate so as to prevent translation of said coupling member.

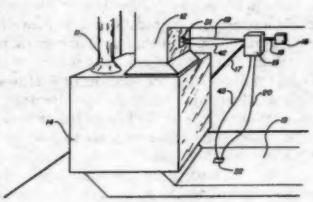
4,682,473
ELECTRONIC CONTROL AND METHOD FOR INCREASING EFFICIENCY OF HEATING AND COOLING SYSTEMS

Charles F. Rogers, III, 10 Moraga Dr., Chico, Calif. 95927

Division of Ser. No. 722,516, Apr. 12, 1985, Pat. No. 4,607,787. This application Apr. 30, 1986, Ser. No. 858,378

Int. Cl.[4] F25D *17/06*

U.S. Cl. 62—89 5 Claims



1. A method of increasing efficiency of a cooling system having a compressor, cooling coils, an inlet whereby air enters said cooling system, an outlet whereby air exists said cooling system, a fan which circulates air through said cooling system and a control for turning a said compressor and said fan on and off, comprising:

positioning a first temperature sensing means in said outlet;

measuring the time said compressor is on during normal operation of said cooling system in cooling a room from a first temperature to a second temperature;

when cooling is agains required, cycling said compressor on for a fractional period of said time said compressor is on during normal operation and off for a sufficient time for the head pressure of said compressor to equalize and continuing to operate said fan while said compressor is on and while said compressor is off until said room reaches a desired temperature;

turning said fan off whenever said outlet reaches a third temperature before said room reaches said desired temperature, and

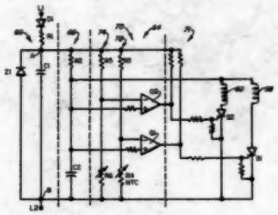
continuing said cycling until said room reaches said desired temperature.

4,682,474

TEMPERATURE RESPONSIVE BAFFLE CONTROL CIRCUIT FOR A REFRIGERATOR

Donald E. Janke, Benton Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 28, 1986, Ser. No. 889,963
Int. Cl.[4] F25D *17/04*; F24F *7/00*
U.S. Cl. 62—187 **18 Claims**



1. A control for a refrigeration apparatus having air cooling means and a compartment to be cooled by air delivered thereto from the air cooling means, said control comprising:

means defining an air flow passage between said air cooling means and said compartment;

baffle means for selectively opening or closing said air flow passage;

first and second alternatively operable solenoid means for moving said baffle means to selectively open and close said air flow passage;

temperature sensing means for sensing the temperature in said compartment and generating a voltage corresponding to the sensed temperature;

set point means for generating a voltage corresponding to a desired temperature;

timer means repeatedly generating a voltage representing a cycle time;

circuit means for comparing said voltage generated by said temperature sensing means with the voltage generated by said timer means, and comparing the voltage generated by said set point means with the voltage generated by said timer means, for selectively energizing either said first or said second solenoid coil once during each generated cycle time; and

means for resetting said timer means to start a new cycle when said timer means voltage exceeds either said set point means voltage or said temperature sensing means voltage.

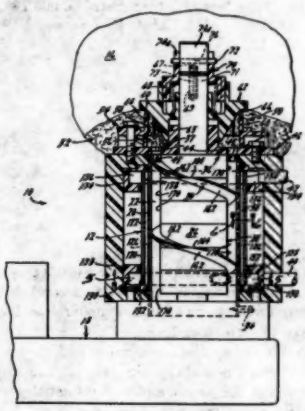
4,682,475

ICE MAKING APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to Ewing-Seeley Thermos Co., Prospect Heights, Ill.

Division of Ser. No. 694,612, Jan. 24, 1985, Pat. No. 4,574,593, which is a continuation-in-part of Ser. No. 570,610, Jan. 13, 1984, Pat. No. 4,576,016. This application Mar. 7, 1986, Ser. No. 837,411
Int. Cl.[4] F25C *1/14*
U.S. Cl. 62—354 **31 Claims**

1. In an ice-making apparatus including a housing defining a substantially cylindrical freezing chamber, refrigeration means adjacent the freezing chamber, means for supplying ice make-up water to the freezing chamber, an axially-extending auger rotatably mounted in the freezing chamber, the improvement wherein said auger includes a central body portion, at least one flight portion extending in a generally spiral path along at least a substantial part of the axial length of the periphery of said central body portion with the outer edges of said flight portion being adapted to be disposed closely adjacent the inner surface of the housing in order to scrape ice particles therefrom as said auger is rotated, said flight portion being defined by at least a pair of axially adjacent discontinuous flight segments generally circumferentially spaced from one another and extending in a generally spiral direction along a part of said generally spiral path, said adjacent pair of said discontinuous flight segments being spirally misaligned relative to one another in order to



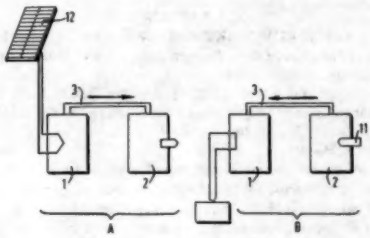
form a spiral non-uniformity therebetween, said spiral misalignment and said circumferential spacing of said adjacent discontinuous flight segments tending to break up the mass of ice particles scraped from the inner surface of the housing as said auger is rotated, said adjacent pair of discontinuous flight segments being interconnected by an interconnecting flight segment, said interconnecting flight segment extending in a direction generally transverse to said discontinuous flight segments.

4,682,476

THREE-PHASE HEAT PUMP

Didier Payre; Georges Crozat, and Bernard Spinner, all of Perpignan, France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Jun. 25, 1984, Ser. No. 623,964
Claims priority, application France, Jul. 1, 1983, 83 10955
Int. Cl.[4] F25B *17/08*
U.S. Cl. 62—480 **23 Claims**



1. In a thermochemical heat pump enabling the transfer of calories from a first heat source (1, 4) to a second heat source (2, 5), using a reactive medium, the improvement comprising that the exchange of calories between one of the two sources and said reactive medium takes place by means of a reaction between a gas and a liquid phase, wherein the liquid phase is

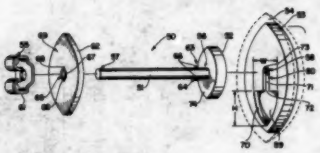
selected from a liquid phase present in the group consisting of (1) a solid and a liquid solution saturated with said solid and (2) two non-miscible liquids, said reaction being monovariant.

4,682,477

CONVERTIBLE PIERCED-EARLOBE EARRING

Marilyn L. Vaillancourt, Old Never Sink Rd., Danbury, Conn. 06811

Filed Nov. 22, 1985, Ser. No. 800,746
Int. Cl.[4] A44C 7/00
U.S. Cl. 63—12 **13 Claims**



1. A convertible pierced-earlobe earring comprising:

(a) an elongate post having first and second ends and manufactured from a non-allergenic material and adapted to be passed though an earlobe;

(b) a substantially flat, decorative end member, manufactured from a non-allergenic material, and disposed at the first end of the post in a plane substantially perpendicular to the longitudinal axis of the post;

(c) an ornamentation adaptor member having ornamentation associated therewith and disposed adjacent the decorative end member, including means for releasably securing the ornamentation adaptor member to the decorative end member; the releasable securing means including a cavity disposed within the ornamentation adaptor member for receiving the decorative end member therein and retaining means having a transversely opening slot formed therein and extending along the rear side of said decorative end member when the decorative end member is received in the cavity with said post received in said slot for engaging an adjacent portion of the post; and

(d) means for locking the post and ornamentation adaptor members, having the decorative end member received therein, with respect to the earlobe, the locking means being disposed adjacent the second end of the post and manufactured from a nonallergenic material, whereby the visual appearance of the earring may be altered through use of different ornamentation associated with the ornamentation adaptor member.

4,682,478

DEVICE FOR MAKING A NEW TYPE OF YARN

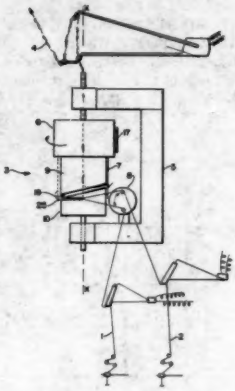
Gilbert Gauthier, Loire, France, assignor to Moulinages Henri Lacroix, France

Filed Apr. 11, 1985, Ser. No. 721,922
Claims priority, application France, Apr. 24, 1984, 84 06620
Int. Cl.[4] D04B 31/02
U.S. Cl. 66—81 **3 Claims**

1. A device for obtaining novelty yarns from at least two elementary yarns, said elementary yarns being connected to each other by a chain of stitches constituted by at least one of the two yarns, comprising, mounted on a common support disposed between the source of supply of the elementary yarns and the means for winding the novelty yarn formed:

a rotatable hollow spindle having an internal channel inside which passes the yarn made, said spindle supporting and rotating at least one knitting needle, said needle comprising a nose which is always in the same plane during the rotation of said spindle;

means for presenting at least one of the elementary yarns in the nose of the needle during the rotation of said spindle;



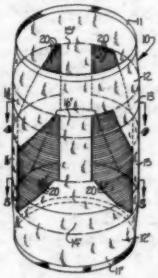
a fixed assembly for casting off stitches formed on said needle and guiding the novelty yarn obtained inside the internal channel of the hollow spindle.

4,682,479

SEAMLESS KNIT COMPOSITE GARMENT BLANK AND METHOD

Bruce M. Pernick, 74-10 88th St., Glendale, N.Y. 11385

Filed Sep. 16, 1986, Ser. No. 907,808
Int. Cl.[4] A41B 9/00
U.S. Cl. 66—176 **6 Claims**



5. A method of knitting an elongate seamless knit composite garment blank including first and second individual garment blanks having portions in intermating relationship, said method including the steps of

(a) knitting a plurality of successive complete courses and forming a panty portion of said first individual garment blank,

(b) knitting a plurality of successive partial courses in spaced-apart relationship and on opposite sides of said panty portion and forming fashioned front and rear sections of said first garment blank,

(c) and while simultaneously knitting successive partial courses in spaced-apart relationship and between the partial courses forming said front and rear panels of said first garment blank and forming fashioned front and rear sections of said second garment blank, and while not knitting between said front and rear panels of both blanks whereby opposite ends of said simultaneously knit partial courses of said front and rear panels of said second garment blank are

spaced from opposite ends of said simultaneously knit partial courses of said front and rear panels of said first garment blank, and

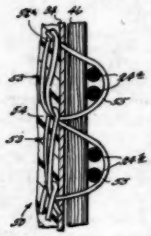
(d) knitting a plurality of successive complete courses interknit with said front and rear fashioned sections of said second individual garment blank and forming a panty portion of said second individual garment blank.

4,682,480

WARP-KNIT, WEFT-INSERTED FABRIC WITH SUBSTRATE AND METHOD AND APPARATUS TO PRODUCE SAME

Julius Schnegg, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 4, 1985, Ser. No. 784,555
Int. Cl.[4] D04B 23/08
U.S. Cl. 66—192 **11 Claims**



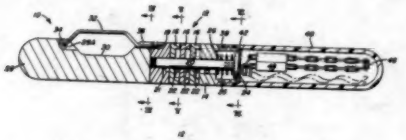
1. A warp knit fabric comprising a substrate, plural warp yarns laid on a face of said substrate, plural weft yarns laid over said warp yarns and perpendicular to the warp direction, and plural stitch wales spaced-apart along the warp-wise direction of said fabric and being stitched through said substrate to hold said weft and warp yarns in position on said substrate; the stitch loops of the stitch wales disposed on one side of said substrate, and the stitch underlap disposed over said warp and weft yarns.

4,682,481

PERSONAL LOCKING DEVICE

Gary S. Dimmick, Oakmont, and Scott Lockerman, Sewickley, both of Pa., assignors to Lockman Products Company, Inc., Pittsburgh, Pa.

Filed Jun. 13, 1986, Ser. No. 874,220
Int. Cl.[4] E05B 73/00
U.S. Cl. 70—14 **8 Claims**



1. A personal locking devise comprising,

a safety pin,

a lock having a housing with a pin receiving recess formed to be axially aligned with said safety pin,

a lock element slidably received within said lock housing, said lock element being movable axially relative to said lock housing between a locked position and an unlocked position.

said lock element having affixed thereon a safety pin housing,

said safety pin retained by said pin housing for movement between an open position and a closed position wherein said safety pin end is axially aligned with said pin receiving recess, and

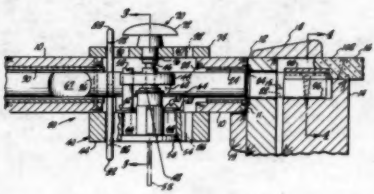
said lock element and said lock housing coacting with said pin housing so that when said pin is in the closed position on said lock housing and said lock element is in the locked position the end of said pin is received within said pin receiving recess to thereby lock said pin in a closed position.

4,682,482

DEADBOLT LOCK

Marvin Z. Hall, 4535 E. Prieto Rd., Altadena, Calif. 91001

Filed Apr. 11, 1986, Ser. No. 850,957
Int. Cl.[4] E05B 65/06
U.S. Cl. 70—129 **20 Claims**



1. A deadbolt mechanism for a door having first and second opposed sides, the mechanism comprising:

(a) an elongated cylindrical bolt having a first transverse arcuate depression therein;

(b) means for guiding the bolt in the door between the first and second sides, the bolt being moveable from an extended position to a retracted position;

(c) a spindle unit having a cam for selectively engaging the first depression, the cam being rotatable between an engaged position securing the bolt in the extended position, and a released position permitting movement of the bolt; and

(d) handle means on the bolt for moving the bolt between the extended and retracted positions, the handle means protruding at least one side of the door.

4,682,483

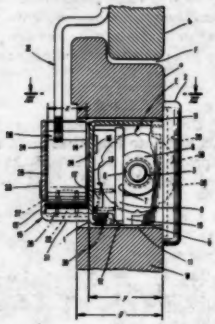
PERMUTATION LOCK

Hans U. Werner, Solingen, Fed. Rep. of Germany, assignor to S. Franzen Sohne GmbH & Co. KG, Solingen, Fed. Rep. of Germany

Filed Sep. 9, 1986, Ser. No. 905,234
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540533
Int. Cl.[4] E05B 37/02
U.S. Cl. 70—312 **11 Claims**

1. In a permutation lock adapted to secure a hasp, said lock comprising a main housing having a front plate with a plurality of windows, a permutation setting mechanism including manually actuable setting elements protruding through the windows, a plurality of rotary members operably connected to said setting elements, said rotary members each including an interruption on its outer periphery, a movable spring-biased locking element engageable with said rotary members in such manner that said locking element is situated in a locking position if any of said setting elements is off-combination and in an unlocking position if all of said setting elements are on-combination, a movable spring-biased locking bolt arranged for rotation between a locking position for securing the hasp and an unlocking position for releasing the hasp, said locking element when in its locking position preventing said bolt from moving from its locking position to its unlocking position, an ancillary housing connected to said main housing at a rear end thereof opposite said front plate, said bolt and its biasing spring being mounted in said ancillary housing, one of said main and ancillary housings including a wall between said locking bolt

and said locking element, said locking element including a lock portion arranged to project through an opening defined by a



region not covered by said wall, when said locking element is in its locking position, in order to prevent rotation of said bolt from its locking position to its unlocking position.

4,682,484

TUMBLER PLATE CYLINDER LOCK

Ching-Hsuan Yeh, 4th Floor, No. 19, Lane 187, Nei Hu Road, Sec. 3, Taiwan, Taipei, Taiwan

Filed Apr. 15, 1986, Ser. No. 852,443

Int. Cl.[4] E05B *29/08*

U.S. Cl. 70—364 R **3 Claims**

1. A tumbler plate clylinder lock comprising:

a housing having a first center b ore and being provided with a plurality of longitudinal slots around the inner peripheral wall thereof;

a cylinder rotatably mounted into said first center bore and being provided with a second center bore;

a plurality of locking members snugly mounted within said second center bore, each of said locking members having a center opening and two extensions extending longitudinally and outwardly from said center opening, one side wall of each of said center openings being provided with a projection extending along the longitudinal axis thereof and having a length corresponding to the depth of a depression formed on the outer periphery surface of a shank of a key adapted to lock and open said cylinder lock;

guide means for spacing and guiding said locking members; and

a plurality of arciform shaped spring members, each spring member being interconnected between each two of said locking members to urge said pair of locking members in opposite directions to move along said guide means and cause one extension of a corresponding locking member to engage with a respective one of said longitudinal slots to prevent said cylinder from turning relative to said housing.

4,682,485

METHOD OF FORMING A CYLINDRICAL SLEEVE

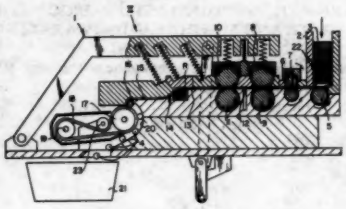
André A. F. L. Vanhille, Boechout, Belgium, assignor to Sobemi N.V., Lint, Belgium

Filed Oct. 15, 1984, Ser. No. 660,883

Claims priority, application Netherlands, Oct. 20, 1983, 8303615

Int. Cl.[4] B21D *11/00, 51/00*

U.S. Cl. 72—133 **9 Claims**



1. The method of making a cylindrical sleeve from a plate of predetermined width, thickness and length so that the plate presents opposite side surfaces and opposite end edges, which comprises the steps of:

feeding the plate lengthwise while confined in its thickness dimension and terminating the confinement of the plate in its thickness direction while initiating deformation of the plate into final cylindrical form by progressively forcing one side surface of the emerging plate along an arcuate path of a length of at most one half the length of the plate and having a radius substantially equal to the radius of the sleeve to be formed; and

continuing the feeding of the plate until the opposite end edges of the plate are in substantially contiguous relation and the cylindrical sleeve has been formed.

4,682,486

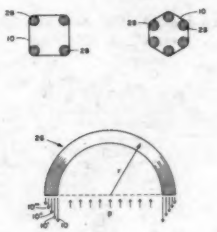
AMORPHOUS ALLOY TOROIDS

Fred Luborsky, Schenectady, and Daeyong Lee, both of Scotia, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1981, Ser. No. 303,339

Int. Cl.[4] B21C *47/00;* **H01F** *7/06*

U.S. Cl. 72—148 **1 Claim**



1. A method for providing an amorphous alloy non-circular toroid having improved soft magnetic properties comprising the steps of:

obtaining an amorphous alloy in a ribbon form; and

spirally winding said ribbon under tension to form a winding having a preselected number of turns

by wrapping said ribbon in sucessive turns over at least two (2) spatially removed pole pieces with progressively less tension in said turns to minimize radially acting compressive stress over the volume of the toroid while maximizing

the curvature of said pole pieces; to minimize radially acting compressive stress in portions of the turns surrounding the pole pieces and thereby provide an amorphous alloy non-circular toroid having improved soft magnetic properties with a maximized packing fraction.

4,682,487

METHOD FOR RECONDITIONING SPOT WELDING ELECTRODES

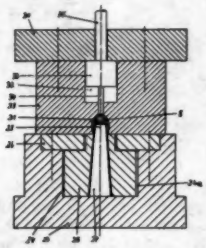
Werner Kaeseler, Meisenweg 8, D-3507 Baunatal-Altenritte, Fed. Rep. of Germany

Continuation of Ser. No. 591,923, Mar. 21, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,569

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310423

Int. Cl.[4] B21D *22/00*; B23K *11/30, 35/00*

U.S. Cl. 72—354 1 Claim



1. Method in two stages for reconditioning used spot welding electrodes having bores comprising in the first stage the steps of introducing a first punch having a head which has a slightly smaller external cross-section than the desired internal cross-section of the bore of the reconditioned electrode into a bore of a worn out electrode so that said head projects slightly less than the depth of the desired bore of the reconditioned electrode, pressing said worn out electrode by means of said first punch into a first die having a die bore of a slightly wider cross-section than the desired reconditioned electrode, during which pressing step the die being self-aligning to the electrode, and moving a slidably mounted concave front end die portion in the die bore and pressing said die portion against the worn out electrode to reform it to a desired shape, said method in the second stage further comprising the steps of introducing a second punch having a head which has the same cross-section and length as the desired bore of the reconditioned electrode into the bore of the electrode prepared in said first stage, and pressing said prepared electrode by means of said second punch into a second die corresponding in shape to the desired reconditioned electrode while the second die is self-aligning to the electrode.

4,682,488

APPARATUS FOR FORMING SLIT FIN COILS

John R. McManus, Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 10, 1985, Ser. No. 690,435

Int. Cl.[4] B21D *9/07*

U.S. Cl. 72—387 2 Claims

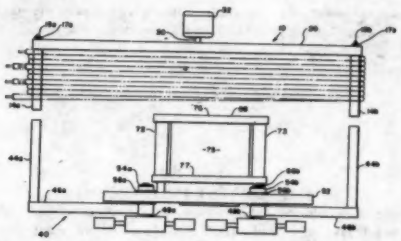
1. Apparatus for forming a slit fin heat exchanger from a flat coiled, two row coil comprising:

a platen means having a planar portion and a plurality of cylindrical portions with at least one of said cylindrical portions being tangent to said planar portion;

a pair of spaced, cylindrical parallel mandrels spaced from and rotatable about a pair of spaced, adjustable, fixed parallel axes which are initially between and in a common plane with said mandrels and axially spaced from said platen means to prevent said axes from overlying said platen means and with said common plane initially bisecting said mandrels into upper and lower portions and being always fixedly spaced from and parallel to said planar portion;

at least a portion of said mandrels extending axially beyond said fixed parallel axes so as to initially overlie a plane defined by said planar portion of said platen means

and said bisected mandrels extending on either side of said common plane to initially define a first plane tangent to said lower portions of said mandrels and parallel to and intermediate said common plane and said planar portion, and a second plane tangent to said upper portions of said mandrels and parallel to said first plane and on the opposite side of said common plane as said first plane with said



first and second planes defining the location of a two row coil placed on said mandrels; and

means for rotating said mandrels about said axes in opposite directions such that they move toward said platen means and each other such that said upper and lower portions of said mandrels which initially defined said first plane and said second plane sequentially become coplanar with said planar portion and then move past whereby a flat coiled, two row coil placed on said mandrels will be moved into contact with said planar portion of said platen means to cause nesting of the two rows of the coil with further rotation of said mandrels moving the coil into contact with said cylindrical portions to cause further forming of the coil.

4,682,489

PROCESS FOR INCREASING THE FATIGUE STRENGTH OF COMPONENTS WITH DIFFERENT SHAPES OR DESIGNS

Hans Bauerle, Spitzwegstr. 13; Hansgeorg Peste, Am Schimmelberg 55, both of D-7080 Aalen 1, and Erwin Pohlner, Ahornweg 2, D-7099 Adelmannsfelden, all of Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 797,232

Int. Cl.[4] B21K *1/08*

U.S. Cl. 72—460 5 Claims

1. Apparatus for increasing the fatigue strength of components, comprising:

(a) a base supporting a basic member,

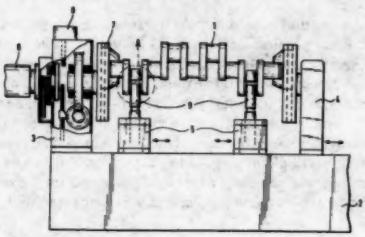
(b) a bearing surface on the basic member for supporting a component,

(c) a clamp member mounted on and spaced from the basic member for interposing a component between them,

(d) resilient connector means interconnecting the basic member and clamp member for urging the clamp member resiliently toward the basic member for clamping a component therebetween,

(e) snap die means on the basic member movable toward and

away from a clamped component for cold forming the latter, and



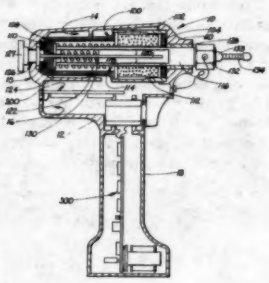
(f) percussion drive means on the base engaging the snap die means for moving the latter to impact a component to be cold formed thereby.

4,682,490

IMPACT TEST INSTRUMENT

Roger A. Adelman, 1562 Wittlou Pl., Cincinnati, Ohio 45224, and David A. Corelli, 6527 Fountains Blvd., West Chester, Ohio 45069

Filed Jan. 31, 1985, Ser. No. 696,956
Int. Cl.[4] G01N *3/30*; G01M *7/00*
U.S. Cl. 73—12 **14 Claims**



1. An impact test instrument for structural testing, comprising:

(a) a housing;

(b) movable means at least partially disposed in said housing for imparting a controlled and repeatable impact to an external structure whose position is stationary relative to said housing, said movable means including a force transducer for detecting the amplitude-time signature characteristics of the impact between the movable means and the external structure; and

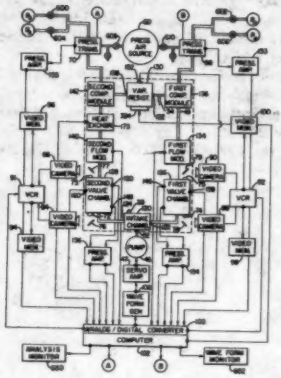
(c) pulse means responsive to an a.c. electrical source for triggering the movement of said movable means and initiating impact between said movable means and the external structure, said pulse means being adjustable to vary the total electrical energy of the application of a half wave of the a.c. power source to the movable means, said pulse means providing an isolated pulse having a maximum predetermined repetition rate whereby isolated impact can be imparted to a repeatedly precise location on said external structure.

4,682,491

APPARATUS AND METHOD FOR TESTING PROSTHETIC HEART VALVES

Murphy L. Pickard, 3250 Pierce St., Wheatridge, Colo. 80030

Filed Feb. 19, 1986, Ser. No. 830,854
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—37 **42 Claims**



1. Apparatus adapt to test prosthetic heart valves under flow conditions of a fluid through a flow channel simulating a circulatory system into which the valves are to be used, comprising:

an intake chamber for receiving said fluid having a fluid inlet, a first intake orifice and a second intake orifice;

a first test chamber in fluid communication with said first intake orifice and defining a first test portion of said flow channel, said first test chamber including a first mounting fixture moveably received therein and having a first cavity adapted for securing a first heart valve whereby the first heart valve may be selectively moved from a passive position out of the flow channel and into a first test position interposed in said flow channel, said first mounting fixture having first dynamic sealing means for maintaining a fluid seal with said first test chamber as the first mounting fixture moves therein;

a second test chamber in fluid communication with said second intake orifice and defining a second test portion of said flow channel, said second test chamber including a second mounting fixture moveably received therein and having a second cavity adapted for securing a second heart valve whereby the second heart valve may be selectively moved from a passive position out of the flow channel and into a second test position in said flow channel, said second mounting fixture having first dynamic sealing means for maintaining a fluid seal with said second test chamber as the second mounting fixture moves therein;

a restriction chamber defining a restrictive portion of said flow channel and having first and second restriction chamber flow orifices, said restriction chamber including restriction means for selectively varying resistance to the flow of the fluid through the restriction chamber;

first conduit means for interconnecting said first restriction chamber flow orifice and said first test chamber for fluid flow therebetween and defining a first conduit portion of said flow channel;

second conduit means for interconnecting said second restriction chamber flow orifices and said second test chamber for fluid flow therebetween and defining a second conduit portion of said flow channel;

first fluid pressure compensation means in fluid communication with the flow channel in said first conduit portion for selectively applying pressure to fluid therein and having a

first compensation reservoir adapted to receive excess fluid in the flow channel;

second fluid pressure compensation means in fluid communication with the flow channel in said second conduit portion for selectively applying pressure to fluid therein and having a second compensation reservoir adapted to receive excess fluid in the flow channel; and

pump means for cyclically pumping fluid alternately by a power stroke and a recovery stroke, said fluid being pumped during the power stroke through said fluid inlet towards said first and second test chambers whereby one of said first and second heart valves passes the fluid therethrough while the other one of said first and second heart valves resists fluid flow, fluid being pumped during the power stroke accumulating under pressure in said first and second compensation reservoirs, and during the recovery stroke whereby said one of the heart valves closes and the other one of the heart valves opens so that said first and second fluid pressure compliance means force fluid through the other one of heart valve back into said intake chamber, said restriction means being selectively adjustable to permit flow of a volume of fluid over a time period of one pump cycle which volume is equal to the volume of fluid displaced by the power stroke of the pump;

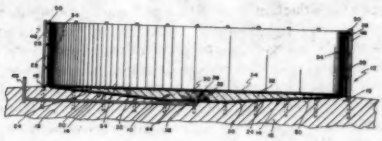
said intake chamber, said first and second test chambers, said restriction chamber, and said first and second conduit means forming the flow channel containing fluid for circulation therethrough.

4,682,492

MEANS AND METHOD FOR DETECTING LEAKS IN TANKS

Marion C. Green, 1999 Amidon, Suite 208, Wichita, Kans. 67203

Filed Jul. 8, 1985, Ser. No. 752,841
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—49.2 **20 Claims**



1. A system for detecting leaks in a tank means, or the like, comprising an excavation basin means in a ground having a surface and including a periphery and defining a generally saucer-like formation with a basin surface which slopes from said periphery;

a tank means supported by said excavation basin means, said tank means having a permeation barrier means extending from the periphery of the basin excavation and supported by and conforming to the basin surface of the saucer-like formation, an impervious corrosion curtain means integrally bound to said permeation barrier means at the periphery of the basin and defining an upright side wall of the tank means, particulate matter means supported by said permeation barrier means, a liquid-impervious liner means continuously extending from the top of and down said corrosion curtain up-right side wall and across the top of the particulate material that is being supported by the permeation barrier means;

a liquid-leakage receiver means positioned in said particulate matter;

a monitor conduit means bound to said receiver means and piercing the barrier means and extending under the excavation basin means outwardly therefrom beyond the periphery of said excavation basin;

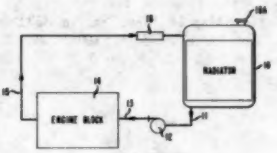
and a leak-check tube means attached to said monitor conduit means under the ground and projected upwardly therefrom beyond the surface of the ground.

4,682,493

COOLING SYSTEM MONITOR

Martin Tenenbaum, Hartsdale, N.Y., assignor to Dakten Products Corp., Bronx, N.Y.

Continuation of Ser. No. 532,368, Sep. 15, 1983, abandoned. This application Aug. 1, 1986, Ser. No. 892,894
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **7 Claims**



7. Apparatus for monitoring the cooling system of a liquid-cooled internal combustion engine having a radiator and a conduit in fluid communication with an upper section of the radiator, said apparatus comprising:

(a) a housing adapted to be connected in line with the conduit at the same level as the upper section of the radiator such that liquid may flow through said housing;

(b) means for providing a visual indication of the level of liquid within the upper section of the radiator;

(c) means for indicating the rate of flow of said liquid in said housing;

(d) means for indicating the pressure of said liquid in said housing; and

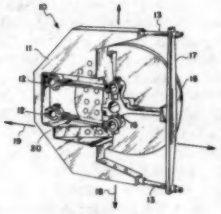
(e) means for indicating the temperature of said liquid in said housing.

4,682,494

AIRFOIL FLUTTER MODEL SUSPENSION SYSTEM

Wilmer H. Reed, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Jul. 30, 1986, Ser. No. 890,575
Int. Cl.[4] G01M *9/00*
U.S. Cl. 73—147 **11 Claims**



1. A wind tunnel model suspension system for testing flutter comprising:

a mounting bracket assembly for attaching the suspension system to the outside of a wind tunnel;

a drag-link assembly having a forward end pivotally attached to said mounting bracket assembly and having a rearward end configured for attachment of an airfoil test model;

pitch springs attached to said drag-link assembly allowing pitch oscillation at low stiffness;

plunge springs attached to said drag-link assembly providing a low stiffness system that will accommodate large steady lift forces without the need for large static spring deflections to counteract such forces;

a compression spring attached to said drag-link assembly and

acting in opposition to said plunge springs so as to allow adjustment of plunge stiffness;

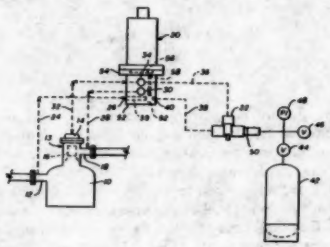
whereby an airfoil may be tested at various angles-of-attack and airloads while maintaining low resistance to pitch and plunge flutter modes.

4,682,495

TESTING DEVICE FOR PILOT VALVES

Michael D. McNeely, Katy, Tex., assignor to Anderson, Greenwood & Company, Houston, Tex.

Filed May 14, 1986, Ser. No. 863,080
Int. Cl.[4] F16K *37/00*; G01M *19/00*
U.S. Cl. 73—168 **15 Claims**



1. In a fluid system having a non-flowing pilot valve for controlling a main pressure relief valve having a dome and pressure responsive element therein, the pilot valve having a fluid inlet sensing chamber including a fluid inlet line thereto, a fluid outlet chamber, and an intermediate fluid chamber between said inlet and outlet chambers in fluid communication with the dome of the main relief valve;

a fluid testing device for testing the functioning of said pilot valve in controlling the main relief valve, said testing device comprising:

a body having a test fluid inlet adapted to be connected to a test fluid pressure source for supplying test fluid to the testing device;

a fluid responsive shuttle valve member positioned within said fluid inlet line to the fluid inlet sensing chamber of said pilot valve, said shuttle valve exposed on opposite sides thereof to operating fluid pressure from said inlet line and test fluid pressure from said test inlet, said shuttle valve member movable by the higher fluid pressure between one position permitting fluid flow between the operating fluid pressure source and the fluid sensing chamber while blocking fluid flow from said test inlet, and a second position permitting fluid flow from the test inlet to the sensing chamber while blocking fluid flow from the operating fluid pressure source; and

a separate valve element between the test inlet and said shuttle valve member being actuated at a predetermined high test fluid pressure from the test inlet thereby to simulate the action of the pressure responsive element in the dome of said pressure relief valve.

4,682,496

FLOW RATE DETECTING APPARATUS HAVING SEMICONDUCTOR CHIPS

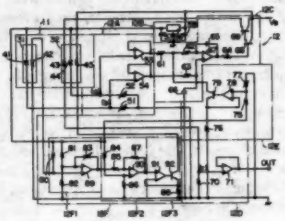
Kazuhiko Miura, Aichi; Tadashi Hattori; Yukio Iwasaki, both of Okazaki; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 10, 1985, Ser. No. 690,245
Claims priority, application Japan, Jan. 18, 1984, 59-7591
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **7 Claims**

1. A flow rate detecting apparatus comprising:

a first semiconductor structure, arranged at a first position in a flow path to be flow rate detected, including a first temperature detection element for detecting ambient air temperature, and a first temperature control heater constituted by a diffusion resistance portion of said semiconductor structure for heating air in the vicinity of said first heater and providing a voltage signal in response to ambient air temperature;

a second semiconductor structure, arranged at a second position in said flow path downstream of said first semiconductor structure, including a second temperature control heater producing heat by a flow of current therein, said second temperature control heater having a resistance that is a function of ambient air temperature, a preliminary heater controlled to generate heat in response to a change of voltage across said first temperature control heater, and a second temperature detection element for detecting heat generated by said second temperature control heater and



said preliminary heater, said second temperature control heater and said preliminary heater being constituted by diffusion resistance portions of said second semiconductor structure;

a first current conduction control means for controlling current conduction through said preliminary heater so as to maintain constant heat generation by said preliminary heater;

a second conduction control means for controlling current conducting through said second temperature control heater on the basis of the temperature detected by said first and second temperature detection elements; and

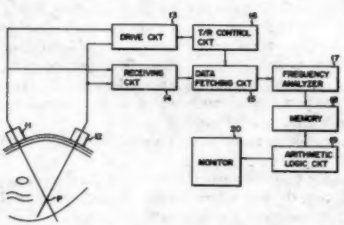
output means for outputting a signal that is a function of the state of current conduction through said second temperature control heater which signal provides an indication of flow rate.

4,682,497

ULTRASONIC IMAGING APPARATUS

Hiroshi Sasaki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1986, Ser. No. 835,195
Claims priority, application Japan, Mar. 4, 1985, 60-43248
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—602 **9 Claims**



1. An apparatus for examining the characteristics of a target P within an object comprising:

first and second ultrasonic transducers spaced apart by a preselected distance for converting electrical signals into

ultrasonic pulses and for converting received ultrasonic echoes into electrical echo signals;

means coupled with said first ultrasonic transducer for causing said first ultrasonic transducer to emit an ultrasonic pulse along a first beam axis toward a target P within the object;

receiving means coupled with said first and second ultrasonic transducers for receiving a first echo signal corresponding to the ultrasonic pulse reflected from said target P along the first beam axis and a second echo signal corresponding to the ultrasonic pulse scattered at the target p and travelling along a second beam axis which intersects at a predetermined angle with the first beam axis and extends to said second transducer; and

comparing means coupled with said receiving means for comparing the first echo signal and the second echo signal and obtaining from the comparison angular dependency characteristic of the scattering of pulses at the target P, free from the influence of attenuation and scattering along the path to and from the target P.

4,682,498

SURFACE TESTING APPARATUS

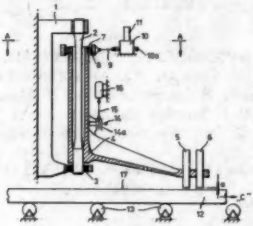
Ing. H. Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Essen, Fed. Rep. of Germany

Filed Jun. 24, 1986, Ser. No. 877,846

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524106

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—618 **10 Claims**



1. A surface testing apparatus comprising: at least one sensor (**5, 6, 104, 205, 305**) for testing a surface (**17**), carrier means (**4, 103, 204, 301**) for carrying said sensor, means for reciprocatingly moving said carrier such that said sensor is reciprocatingly moved over said surface, said moving means being constructed as a vibratory system having a natural frequency and including said carrier, and an exciter means (**14, 14a, 15** or **21, 22, 23, 24, 25**, respectively) for operating said vibratory system at or in the neighborhood of its natural frequency such that said sensor is moved over said surface with said natural frequency or with a frequency in the neighborhood thereof.

4,682,499

PRESSURE TRANSMITTER

Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed May 9, 1986, Ser. No. 861,457

Int. Cl.[4] G01L *7/16*

U.S. Cl. 73—701 **4 Claims**

1. A pressure transmitter comprising

a body having a bore therethrough,

a bonnet secured to said body in covering relationship to one end of said bore,

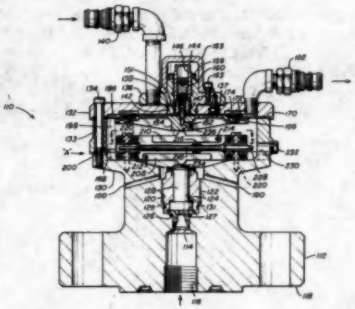
pressure responsive means mounted in said bore and extending beyond the end thereof which is covered by said bonnet,

pressure responsive means carried by said bonnet having a pressure output,

means for delivering signal pressure to the end of said bore not covered by said bonnet,

means for delivering a supply of fluid pressure to said bonnet pressure responsive means, and

means interposed between the extending end of said body pressure responsive means and said bonnet pressure responsive means to adjust the force transmitted to the bonnet pressure responsive means from said body pressure responsive means to calibrate the range of said bonnet pressure responsive means output,



said adjusting means includes

a spacer ring secured between said body and said bonnet,

a frame supported within said spacer ring,

a pair of levers pivotally mounted to said frame with one lever in engagement with the extending end of said body pressure responsive means and the other lever in engagement with the bonnet pressure responsive means,

a movable cylinder between said levers, and

means for moving said cylinder along said levers to change their effective lever arms.

4,682,500

PRESSURE SENSITIVE ELEMENT

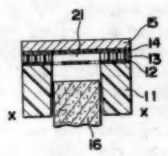
Kazutaka Uda, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1986, Ser. No. 848,930

Claims priority, application Japan, Apr. 11, 1985, 60-78003

Int. Cl.[4] G01L *7/08, 9/00*

U.S. Cl. 73—705 **4 Claims**



1. A pressure sensitive element which comprises:

a pair of light reflecting thin films formed through a thin film producing process and composing a Fabry-Pérot resonator which is arranged so as to face a light transmitting system; and

a pressure deforming member laminated on said light reflecting thin films;

wherein an optical path difference is formed in accordance with an interval of an air gap located between said pairs of light reflecting thin films, said interval of said air gap

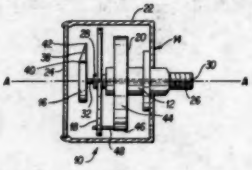
changing by the deformation of said pressure deforming member.

4,682,501

TEMPERATURE COMPENSATED BOURDON TUBE GAUGE

Thomas Walker, 15608 Pamela, Silver Spring, Md. 20904

Filed Apr. 11, 1985, Ser. No. 721,838
Int. Cl.[4] G01L *7/04, 19/04*
U.S. Cl. 73—708 **11 Claims**



1. A temperature-compensated Bourdon tube gauge for indicating a parameter of a pressurized fluid, comprising:

a support structure, including an axis;

a Bourdon tube having a fixed open end connected to receive said pressurized fluid and affixed to said support structure and having a free closed end;

an indicating member, connected to said free end of said Bourdon tube so that movement of said free end causes a corresponding movement of said indicating member relative to said support structure, said indicating member comprising a pointer which is movable in rotation about said axis by the free end of said Bourdon tube;

a dial member having a parameter scale disposed adjacent and extending along the path of motion of said indicating member, said dial member being pivotally connected to said support structure for rotary movement about said axis; and

temperature-responsive means for moving said dial member about said axis in accordance with a temperature sensed by the temperature-responsive means such that said indicating member indicates said parameter on said scale, wherein said temperature-responsive means comprises

a bimetallic element having a fixed end attached to said support structure an a free end which is movable along a predetermined path in accordance with a temperature sensed by the bimetallic element,

a cam which is affixed to said support structure and which includes a curved cam surface extending about said axis,

a lever extending across said cam surface from an input end to an output end,

restraining means for maintaining said lever in contact with said cam surface, and

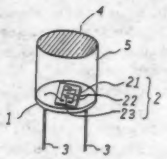
connecting means for connecting the lever input end to the free end of said bimetallic element and the lever output end to said dial element so that movement of the free end of said bimetallic element produces a corresponding movement of said dial member about said axis, said cam surface serving as a fulcrum for said lever, the position of said fulcrum varying along the length of the lever in accordance with the position of the free end of said bimetallic element and the shape of said cam surface.

4,682,502

PRESSURE SENSOR

Shuji Miyoshi, and Masaya Hijikigawa, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 12, 1985, Ser. No. 764,568
Claims priority, application Japan, Aug. 22, 1984, 59-175610
Int. Cl.[4] G01L *7/06, 7/08, 9/02*
U.S. Cl. 73—723 **9 Claims**



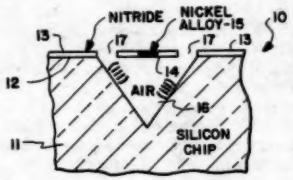
1. A pressure sensor comprising an air-tight container, having water vapor enclosed therein, which elastically deforms depending upon a variation in the external pressure to result in a variation in the content volume thereof, said container including a rigid base member and a further portion air-tightly connected to said base member and being at least partially elastically deformable in response to a variation of the external pressure; a moisture sensor disposed within said further portion of said container; and a moisture detector which electrically detects a variation in the amount of moisture to be absorbed by said moisture sensor depending upon the internal partial pressure of water vapor in said container due to the elastic deformation of said container.

4,682,503

MICROSCOPIC SIZE, THERMAL CONDUCTIVITY TYPE, AIR OR GAS ABSOLUTE PRESSURE SENSOR

Robert E. Higashi, Bloomington; Steven D. James, Edina; Robert G. Johnson, Minnetonka, and Ernest A. Satren, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 16, 1986, Ser. No. 863,892
Int. Cl.[4] G01L *21/12*
U.S. Cl. 73—755 **20 Claims**



8. A microbridge absolute pressure sensor for air or gas comprising:

a silicon microbridge having formed thereon a thin film layer of silicon nitride, said chip having its surface lying in a (100) plane, said chip having a <110> direction along said plane,

an elongated V-shaped groove anisotropically etched into said silicon from said surface, said elongated groove having elongated edges oriented in said <110> direction,

said microchip having an elongated silicon mitride bridging element which has its long edges parallel and proximate to said groove elongated edges, the bridging element having on it a sensor element, said bridging element being attached to said layer at diagonally opposite segments of the long edges,

an electrically resistance sensor strip formed in said bridging

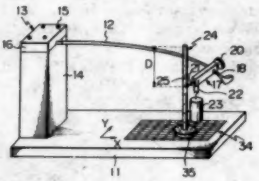
element and extending the length of said bridging element, said strip being adapted to be heated by current flowing therethrough to raise the temperature of said bridging element.

4,682,504

DEVICE FOR MEASURING A STIFFNESS OF A GOLF-CLUB SHAFT

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,589
Claims priority, application Japan, Jul. 31, 1985, 60-167421
Int. Cl.[4] G01N *3/20, 3/00*
U.S. Cl. 73—854 **8 Claims**



1. A device for measuring a stiffness of a golf-club shaft, comprising:

a clamp means for holding one end of said golf-club shaft to be measured so that when said one end of said shaft is held by said clamp means, a longitudinal axis of said shaft is located substantially perpendicular to a vertical axis of said clamp means, and the other end of said shaft remote from said clamp means is unsupported;

a pointer member having a tip end and a root portion, said root portion being detachably attached to said golf-club shaft at a position adjacent to said unsupported end of said shaft in such a manner that when said root portion is attached to said shaft, said tip end is located substantially on a horizontal plane with said root portion thereof perpendicular to longitudinal axis of a said golf-club shaft;

a counterweight detachably attached to said tip end of said pointer member for supplying a predetermined flexure and torsion load to said golf-club shaft through said pointer member; and

a vertical displacement measuring means for measuring the amount of a vertical displacement of said tip end of said pointer member produced by a torsion and flexure of said golf-club shaft when said predetermined load of said counterweight is applied to said golf-club shaft through said pointer member.

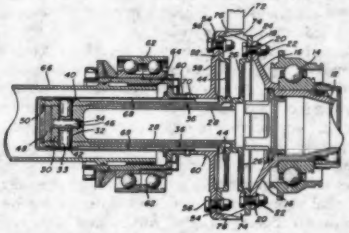
4,682,505

COMPACT TORQUE MEASUREMENT SYSTEM

Pierre Morissette; Alexander W. Stewart, both of St. Lambert, and Keith H. Taylor, Candiac, all of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada

Filed Dec. 13, 1985, Ser. No. 808,480
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.34 **4 Claims**

1. A torque measuring device adapted to be connected to an output shaft of an engine, the torque measuring device comprising at least first and second shaft members, the first shaft member adapted to be coupled at one end thereof to the output shaft of the engine, the second shaft member being tubular and concentric with the first shaft member, with one end of the second shaft member fixedly connected to the other end of the first shaft member, the other end of the second shaft member being adjacent said one end of the first shaft member, and a third shaft member coupled at one end thereof to the other end of the second shaft member, and the third shaft member being tubular and concentric with the first and second shaft members and being adapted to be coupled with an input shaft of means to be driven; the first and second shaft members being elastically deformable in response to the magnitude of the torque being transmitted between the output shaft of the engine and



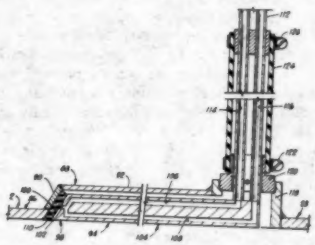
the input shaft of the means to be driven, and detection means associated with the one end of the first shaft member and the other end of the second shaft member to measure the relative phase displacement thereof and thus the magnitude of torque.

4,682,506

AUTOMATIC MATERIAL SAMPLER

Dennis A. Wienck, and Danny K. Mints, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 6, 1985, Ser. No. 795,394
Int. Cl.[4] G01N *1/02*
U.S. Cl. 73—863.54 **8 Claims**



1. An apparatus for sampling material flowing through a pressurized conduit, comprising:

housing means for receiving therethrough a pressurized flow of the material as the material flows through the conduit, said housing means including cross-section defining means for defining a full cross-sectional sample area, and connector means for connecting said cross-section defining means to the conduit so that the cross-sectional sample area defined by said cross-section defining means is aligned with the cross-section of the conduit; and

sampler means, connected with said housing means, for collecting a full cross-sectional sample of the material as the material flows through said cross-section defining means of said housing means under pressure, said sampler means including:

a collection member disposed in said housing means having an elongated inlet element with inlet means for receiving a portion of the flowing material;

movement means for moving said collection member from a location outside the full cross-sectional sample area of the material across the full cross-sectional flow sample area of the material, so that said inlet means receives a portion of said flowing material as it passes thereacross; and

a flow line connected to said collection member, said flow line having a first sample flow channel and a first purge channel defined therein;

said inlet element of said collection member having a second sample flow channel defined therein in communication with said inlet means and said first sample flow channel, and a second purge channel defined therein in communication with said inlet means and said first purge channel.

7. An apparatus for sampling material flowing through a pressurized conduit, comprising:

substantially cylindrical housing means for receiving therethrough a pressurized flow of the material as the material flows through the conduit, said housing means including cross-section defining means for defining a full cross-sectional sample area in a non-concentric position with respect to the axis of said substantially cylindrical housing means, and connector means for connecting said cross-section defining means to the conduit so that the cross-sectional sample area defined by said cross-section defining means is aligned with the cross-section of the conduit; and

sampler means, connected with said housing means, for collecting a full cross-sectional sample of the material as the material flows through said cross-sectional defining means of said housing means under pressure, said sampler means including:

a collection member disposed in said housing means including a shaft disposed substantially along said axis of said housing means and a plurality of vanes connected to said shaft and extending substantially radially therefrom in spaced relation to each other so that any two adjacent vanes define an area which includes the cross-sectional area of the pressurized flow of the material, each of said vanes including a wiper member at the outermost radial extent thereof in contact with the inner substantially cylindrical wall of said housing means;

rotational movement means for rotating the shaft of said collection member whereby said vanes are moved from a location outside the full cross-sectional sample area of the material, across the full cross-sectional, pressurized flow sample area of the material; and sample receiving means including a flow line communicating with the interior of said housing means through the substantially cylindrical wall thereof and located in a circumferentially offset position from said full cross-sectional sample area, and a sample container means for receiving said material from said flow line.

4,682,507

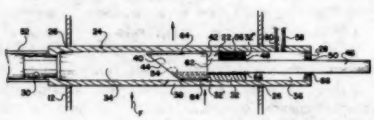
MATERIAL SAMPLING APPARATUS

Michael S. Terrell, Charlotte, N.C., assignor to Duke Power Company, Charlotte, N.C.

Filed Jul. 16, 1984, Ser. No. 631,086

Int. Cl.[4] G01N *1/12, 1/20*

U.S. Cl. 73—863.57 **9 Claims**



1. An apparatus for removing a sample from a moving stream of a material flowing in a predetermined direction through a conduit and delivering said sample to a deposit location outside said conduit, said apparatus comprising:

a. valve means disposed in said conduit for collecting said material sample, said valve means including a fixed valve housing defining an interior sample collection chamber, a port in said housing facing in an upstream direction relative to said direction of material conveyance for passage therethrough into said collection chamber of a portion of said material as said sample, and a valve member selectively movable relative to said collection chamber between positions opening and closing said port for permitting and preventing passage of said material through said port;

b. discharge conduit means communicating with said collection chamber and extending therefrom to said deposit location for conveying said sample thereto; and

c. means for directing a pressurized fluid through said material collection chamber and into said conduit means for expelling said material sample from said collection chamber and carrying said sample through said conduit means, whereby said sample is collected and conveyed to said deposit location without manual handling of said sample to aid in preventing escape thereof.

4,682,508

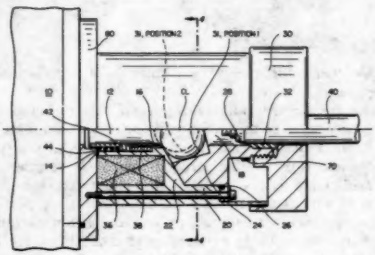
INLET VALVE FOR PROBE APPARATUS

Urs Steiner, Sunnyvale; James Hurst, San Jose, and J. Alan Schier, Menlo Park, all of Calif., assignors to Finnigan Corporation, San Jose, Calif.

Filed Mar. 6, 1986, Ser. No. 840,513

Int. Cl.[4] F16K *31/06*

U.S. Cl. 73—866.5 **9 Claims**



9. A method for probe analysis wherein an apparatus includes a vacuum chamber, a forechamber, an access inlet between said chambers, and an entry inlet preceding the forechamber, said chambers and inlets forming a channel, including a magnetic body comprising the steps of:

evacuating said vacuum chamber so that a pressure differential is developed between said vacuum chamber and said forechamber;

actuating an electromagnet means to move said magnetic body to a first position to seal the access inlet and thereby close the channel between said chambers;

inserting a sampling device or probe device into said entry inlet;

evacuating said forechamber to reduce said pressure differential so that the magnetic body moves to a second position away from said access inlet by gravity force, thereby opening the channel between said chambers; and

fully inserting said device through said forechamber and access inlet and into said vacuum chamber for conducting a desired analysis.

4,682,509

ADJUSTABLE HANDLEBAR FOR BICYCLE

Kikuzo Takamiya, Kitamoto, and Hideyuki Ishibashi, Ageo, both of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Division of Ser. No. 486,869, Apr. 20, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 742,224

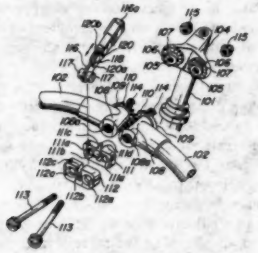
Claims priority, application Japan, Apr. 22, 1982, 58-66356; Apr. 22, 1982, 58-66357; May 27, 1982, 58-88771; Mar. 2, 1983, 59-32923

Int. Cl.[4] B62K *21/16*

U.S. Cl. 74—551.4 **8 Claims**

1. An adjustable handlebar for a bicycle, comprising two handlebar members whose adjacent ends are pivotally sup-

ported by two fasteners extending from an upper portion of a handlebar stem, gear teeth formed on said adjacent ends of the handlebar members and in mesh with each other such that when one of said handlebar members is pivotally moved about one of said fasteners, the other handlebar member is also pivotally moved about the other fastener, anchoring means provided between engaging surfaces of said upper portion of said handlebar stem and of said adjacent ends of said handlebar members for anchoring said handlebar members, and a cam and cam follower assembly having a lever for engaging and disengaging said anchoring means, said cam and cam follower assembly comprising a cam holder adjacent to and in front of



said adjacent ends of said handlebar members, and a retainer plate adjacent to and in front of said cam holder, said cam holder and retainer plate including opposed recesses to form in their adjacent portions a cam fitting cylindrical space, said fasteners passing through said cam holder and said retainer plate so as to permit said holder and plate to slide thereon when the fasteners are loosened, and a cam lever formed at one end with ellipsoid-shaped cams extending in lateral directions and received in said cam fitting cylindrical space to move said cam holder away from said retainer plate when said ellipsoid-shaped cams are rotated in said cylindrical space by moving said cam lever.

4,682,510

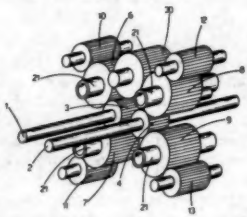
HIGH TORQUE DRIVE MEANS FOR TWO CLOSELY SPACED SHAFTS WHICH ARE ALSO SUBJECTED TO STRONG AXIAL THRUSTS AND APPLICATION THEREOF TO A DOUBLE SCREW EXTRUDER

Stefano De Bernardi, Busto Arsizio, Italy, assignor to Bausano & Figli S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 599,100, Apr. 11, 1984, abandoned. This application Jun. 21, 1984, Ser. No. 622,828

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—665 N **15 Claims**



1. An apparatus for rotationally driving two closely spaced shafts, comprising:

a driven gear on each shaft, each said driven gear being driven by two separate drive gears;

a separate drive means for driving each respective drive gear, each said separate drive means including a motor means;

synchronizing means for constraining each of said two closely spaced shafts to rotate at the same speed; and

said synchronizing means comprises an idler gear, said idler gear engaging a corresponding terminating gear, each said terminating gear being driven by said drive means, and a first pair of said terminating gears driving a first driven gear and a second pair of said terminating gears driving a second driven gear.

4,682,511

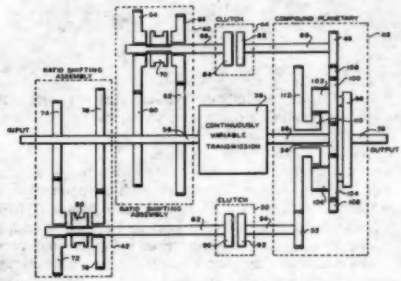
GEAR ASSISTED CONTINUOUSLY VARIABLE TRANSMISSION

Ernest C. Wittke, 585 Bloomfield Ave., Apt. 40, W. Caldwell, N.J. 07006

Filed Oct. 18, 1985, Ser. No. 788,869

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—681 **10 Claims**



1. A transmission system comprising:

a plurality of power transmission paths;

a continuously variable speed ratio transmission in one of said paths having a first input means adapted to be driven by an external prime mover, and a first output means;

a first ratio changing mechanism having a second input means adapted to be driven by said prime mover and having a second output means;

a second ratio changing mechanism having a third input means adapted to be driven by said prime mover and having a third output means, at least one of said ratio changing mechanisms having a plurality of selective ratios other than zero selectively engageable in a respective path;

a compound planetary mechanism including fourth, fifth and sixth input means, and a fourth output means providing an output from said transmission system, said first output means being coupled to said fourth input means, said second output means being coupled to said fifth input means, and said third output means being coupled to said sixth input means;

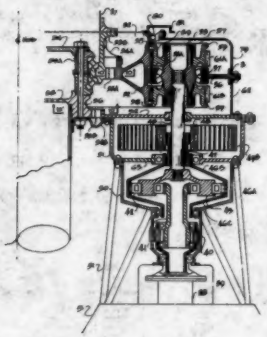
first coupling means for selectively engaging and disengaging one of said paths between said prime mover and said fifth input means, and second coupling means for selectively engaging and disengaging another of said paths between said prime mover and said sixth input means; and

control means for disengaging one of said first and second coupling means in one of said paths when the other of said coupling means is engaged in the other of said paths, said control means providing a selection of ratios of said first and second ratio changing mechanisms such that the ratio of said continuously variable transmission can be alternately decreased and increased respectively with alternate successive ratios of said first and second ratio changing mechanisms without resetting of said continuously variable transmission ratio during the changing of said ratios.

4,682,512
POWER TRAIN FOR HEAVY LIFT HELICOPTERS

Carlton G. Peterson, P.O. Box 27345, Tempe, Ariz. 85282

Filed Sep. 30, 1985, Ser. No. 781,336
Int. Cl.[4] F16H *57/00, 37/06*
U.S. Cl. 74—410 27 Claims



1. An ultra lightweight mechanical shaft-horsepower type power transmission for use in supporting and driving heavy lift helicopters comprising:

a rotatable power output ring gear;

bearingless mounting means solely supporting said rotatable power output ring gear at the pitch diameter of its teeth;

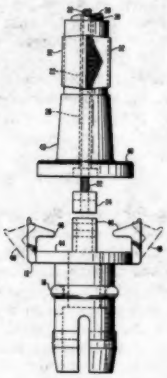
propulsion means parallel and radially disposed with the rotatable axis of said ring gear and operably coupled in load bearing and driving relationship to said rotatable power output ring gear via said mounting means; and

said mounting means providing multiple power inputs to said rotatable power output ring gear in order to provide multiple torque load paths thereto.

4,682,513
REPAIR KIT FOR DETENT CABLES

Leonard J. Reeder, 8055 Greenleaf Ter. - Apt. T1, Glen Burnie, Md. 21061

Filed Jun. 24, 1985, Ser. No. 747,575
Int. Cl.[4] F16C *1/26*
U.S. Cl. 206—223 2 Claims



1. A repair device for a detent cable, comprising,

a substitute detent cable end, said substitute detent cable end and having a lower portion and an upper portion, said lower portion of said detent cable end being configured substantially like the lower portion of an original detent cable end, said upper portion of said detent cable end having an interface flange means and a plurality of equally spaced connector tab means, said interface flange means, said interface flange means being formed integral with said lower portion of said substitute detent cable end and having a periphery, said plurality of connector tab means being spaced apart around the periphery of said interface flange means and being flexibly hinged to and formed integral with said interface flange means, said plurality of equally spaced, connector tab means flexibly hinged to said interface flange means being snapped into a position which rigidly affixes said substitute detent cable end to a remainder of a detent cable end that is being repaired, said interface flange means having an upper interface surface;

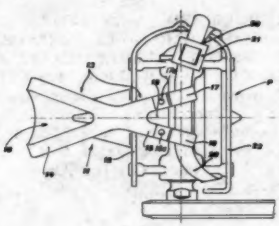
a replacement O-ring, said replacement O-ring being removably affixed to said lower portion of said substitute detent cable end; and

a sealant means, said sealant means being suitably applied to said upper interface surface of said interface flange means wherein said lower portion of said substitute detent cable end consists of a main body means and a plurality of finger-like tab means, said plurality of finger-like tab means being formed integral with said main body means, said main body means having a passageway formed therthrough, said interface flange means having a centrally located aperture formed therein, said passageway in said main body means communicating with said aperture in said interface flange means, said main body means having a channel-like depression formed externally therearound, and said replacement O-ring being removably located in said channel-like depression.

4,682,514
TOE CLIP FOR BICYCLE PEDALS

Mario Jona, Rubano, Italy, assignor to Campagnolo S.p.A., Rubano, Italy

Continuation of Ser. No. 663,683, Oct. 18, 1984, abandoned.
This application Jun. 9, 1986, Ser. No. 873,140
Claims priority, application Italy, Oct. 28, 1983, 23406/83[U]
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 1 Claim

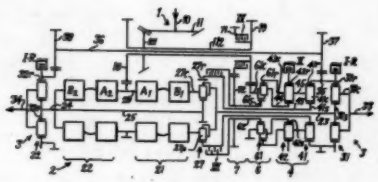


1. A toe clip for bicycle pedals, comprising a flexible metal lamina adapted to be fixed on one side of a bicycle pedal cage, said lamina extending first forward and outwardly and then having a portion extending backwardly, the backwardly extending portion of the lamina ending in two spaced-apart eyelets, and a flexible strap extending through said eyelets, said backwardly extending portion of the lamina having a substantially X-shaped configuration comprised by two forwardly extending legs that diverge forwardly from each other and two rearwardly extending legs that diverge rearwardly from each other, each said eyelet being disposed at the rear end of a respective one of said rearwardly extending legs and extending along only a rear portion of the length of its associated said rearwardly extending leg, each said eyelet being closed at its forward end by a separate fastener that is disposed intermediate the length of the associated said rearwardly extending leg.

4,682,515
GEAR TRAIN FOR FOUR RANGE HYDROMECHANICAL STEERING TRANSMISSION

Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 11, 1984, Ser. No. 659,680
Int. Cl.[4] F16H *47/04*
U.S. Cl. 74—687 **3 Claims**



1. In a synchronous shifting, multi-range, split output, hydromechanical transmission having:
- a mechanical input drive train;
- a mechanical transmission output drive;
- a variable hydrostatic component driven by said input drive train for producing a variable speed hydrostatic output;
- two power path mechanisms for transmission of power to said transmission output drive including:
  - a first power path mechanism responsive to said hydrostatic component for transmitting said variable speed hydrostatic output to said transmission output drive, and
  - a range change mechanism constituting the second power path mechanism of the split output transmission for causing the transmission to operate selectively through said first power path mechanism in a first range or through both said power path mechanisms in two additional ranges having torque ratios distinct from each other and from that of said first range, said range change mechanism including:
    - a third range differential gear set having one element responsive to said mechanical input train so as to be driven mechanically at a constant speed and a second element responsive to said variable speed hydrostatic output to cause said third range set to produce an initial third range hydromechanical product on a third element of said third range set,
    - a second range differential gear reduction set responsive to said first and third elements of said third range set for receipt of a mechanical input for producing a second range reduced constant mechanical speed as an initial portion of a second range product and for passing said initial third range product, and
    - a three element higher range differential gear combining set responsive to said second range reduction set and to said variable hydrostatic component for combining either said second range reduced mechanical speed or said initial third range product with said variable speed hydrostatic output to produce a second range and a third range final product;
- friction devices for selectively activating and inactivating elements of said range change mechanism to cause said transmission to operate in three distinct ranges; and
- output gear means constituting a part of said transmission output train for producing a transmission output responsive to inputs received from either or both of said two power path mechanisms causing said transmission to be a split output transmission;

the improvement wherein:

said range change mechanism also includes mechanical transfer means responsive to the said mechanical input drive train and activating means for selectively supplying an additional mechanical input to said second element of said third range differential gear set to drive the transmission in an additional fourth range.

4,682,516
VEHICULAR TRANSMISSION WITH ADDITIONAL LOW SPEED

Kiyokazu Okubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

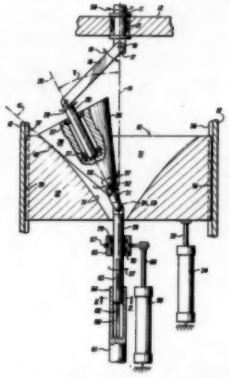
Filed Oct. 8, 1985, Ser. No. 785,461
Claims priority, application Japan, Oct. 9, 1984, 59-211905
Int. Cl.[4] F16H *37/08*
U.S. Cl. 74—701 **12 Claims**

1. A vehicular transmission comprising a main speed change mechanism having plural gear trains capable of being established selectively between parallel input and output shafts and a sub speed change mechanism having a reduction gear train for providing a speed lower than the speed of the lowest gear train of said main speed change mechanism, said sub speed change mechanism having an intermediate shaft and a counter shaft parallel with said input and output shafts, a counter input gear in mesh with a gear mounted on said input shaft at all times rotatably supported on said intermediate shaft, a counter output gear in mesh with a gear mounted on said output shaft at all times and supported by said counter shaft, said reduction gear train being capable of selectively connecting between said counter input gear and said counter output gear, and a synchronizing mechanism disposed for selectively establishing said reduction gear train.

4,682,517
VARIABLE SPEED DRIVE—APPARATUS AND METHOD OF FABRICATING THE APPARATUS

John H. Francis, Charlestown, W. Va., and Roy E. Van DerLinden, Frederick, Md., assignors to Frederick Manufacturing Company, Inc., Frederick, Md.

Filed Jan. 16, 1985, Ser. No. 691,863
Int. Cl.[4] F16H *15/50, 15/16*
U.S. Cl. 74—796 **8 Claims**



1. Apparatus for varying in substantially infinitely small increments the speed ratio of an output shaft relative an input shaft as long as the torque transmitted from one shaft to another remains below a selected torque; the apparatus comprising:

means for axially aligning the output shaft and the input shaft with a first axis;

a track member extending laterally of the first axis and having a curvilinear surface converging toward the first axis;

a conical member rotating about an axel coincident to a second axis and having a conical surface diverging from a first end of the conical member adjacent the apex thereof toward a second end of the conical member, the conical surface engaging the curvilinear surface of the track member;

linkage means for connecting the axel of the conical member adjacent the second end of the conical member to the input shaft while holding the conical surface in engagement with the curvilinear surface the linkage means including a bearing member journaled with the cone and a link piveted to both the bearing member and input shaft, wherein the conical member rolls on the curvilinear surface about the second axis as the input shaft rotates;

means for connecting the conical member to the output shaft adjacent the first end of the conical member, wherein the output shaft rotates as the conical menber rolls;

means for moving the second end of the conical member laterally with respect to the track member while moving the entire conical member axially, whereby the conical surface engages the curvilinear surface of the track member at various locations thereon and the ratio of the output speed with respect ot the input speed is changed;

means for maintaining the apex of the cone in coincidence with the first axis while the cone rolls on the curvilinear surface wherein the cone does not slip with respect to the first surface as the cone transmits rotation from the input shaft to the output shaft as long as the torque is less than the selected torque.

4,682,518

METHOD AND APPARATUS FOR CONTROLLING HYDRAULICALLY-OPERATED POWER TRANSMITTING SYSTEM INCLUDING CONTINUOUSLY VARIABLE TRANSMISSION

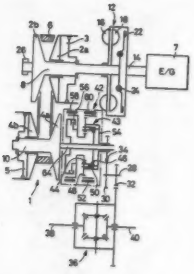
Mitsuru Takada; Hiroshi Itoh, both of Toyota; Shigeki Hiramatsu, Okazaki, and Tadashi Tamura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 21, 1985, Ser. No. 789,709

Claims priority, application Japan, Oct. 24, 1984, 59-221957; Nov. 2, 1984, 59-230330

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—867 **12 Claims**



1. A method of controlling a hydraulically-operated power transmitting system for an automotive vehicle, the power transmitting system including a continuously variable transmission and an auxiliary transmission coupled to the continuously variable transmission, the auxiliary transmission having a plurality of speed-range positions, said method comprising the steps of:

controlling a speed ratio of said continuously variable transmission and selectively placing said auxiliary transmission in one of said plurality of speed-range positions, according to varying parameters of the vehicle;

detecting simultaneous operations of said continuously variable transmission and said auxiliary transmission, which consist of a shift-down action of said auxiliary transmission during a shift-down operation of said continuously variable transmission, and a shift-up action of said auxiliary transmission during a shift-up operation of said continuously variable transmission; and

upon detection of said simultaneous operations, restraining a change in said speed ratio of said continuously variable transmission while said auxiliary transmission is in said shift-down action or said shift-up action.

4,682,519

HYDRAULIC FLUID PRESSURE CONTROL DEVICE FOR A CONTINUOUSLY VARIABLE AUTOMOBILE TRANSMISSION PROVIDING A QUICK SPEED CHANGE RATIO INCREASE

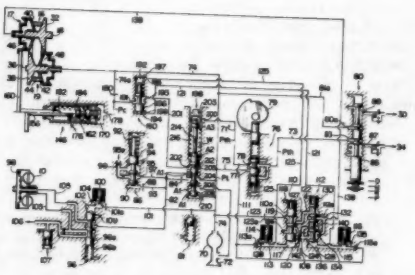
Mitsuhiko Okada, and Hiroshi Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 9, 1984, Ser. No. 669,885

Claims priority, application Japan, Nov. 11, 1983, 58-210993

Int. Cl.[4] F16H *55/56*

U.S. Cl. 74—868 **7 Claims**



1. A control device for a continuously variable belt transmission device comprising a driving pulley assembly including an axially fixed pulley member and an axially movable pulley member, a driven pulley assembly including an axially fixed pulley member and an axially movable pulley member, an endless belt assembly which is fitted in a power transmitting manner around said driving pulley assembly and said driven pulley assembly in V-shaped grooves thereof to provide power transmission therebetween at a speed change ratio, and first and second pressure chambers for said driving and driven pulley assemblies respectively, each of said driving and driven pulley assemblies altering, according to supply of hydraulic fluid pressure thereto, the axial distance between said respective axially fixed and axially movable pulley members so as to alter the effective pulley radius of said respective one of said driving and driven pulley assemblies, said control device comprising:

a speed change speed control device which selectively either supplies, holds or drains an actuating fluid pressure to, in or from said first pressure chamber for said driving pulley assembly, said draining of said actuating fluid pressure from said first pressure chamber being selectively effected at at least two different rates;

a control pressure generating valve which generates a control pressure which decreases along with increase in said speed change ratio;

a line pressure generating valve, which receives supply of said control pressure from said control pressure generating valve, and which generates a line pressure and supplies said line pressure to said second pressure chamber for said

driven pulley assembly, said line pressure decreasing along with increase in said control pressure generated by said control pressure generating valve;

a cutoff valve which, when, said speed change speed control device is draining said actuating fluid pressure from said first pressure chamber for said driving pulley assembly, at a higher rate of said at least two different rates prevents transmission of said control pressure from said control pressure generating valve to said line pressure generating valve; and

means for providing fluid connection of said control pressure generating valve and said line pressure generating valve with said cutoff valve.

4,682,520

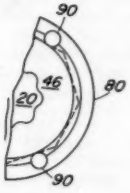
MECHANICALLY LOCKABLE FASTENER ASSEMBLY

Warren E. Gray, Woodland Hills, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Nov. 15, 1984, Ser. No. 671,823

Int. Cl.[4] **F16B** *29/00, 35/04, 39/22*

U.S. Cl. 81—471 **13 Claims**



1. A non-removable fastener assembly for passing through holes in workpieces comprising

a bolt, a nut, and a driving tool,

said bolt having a head at one end and a shaft extending from the head and threaded over a portion of its length,

said nut having a head end and a threaded bore therethrough for engaging the threaded part of the bolt shaft,

said bolt and nut being constructed and arranged for clamping workpieces tightly together permanently under a predetermined a clamp up load when the nut is driven by the tool,

said bolt shaft having a first portion thereof next to said head for passing through the workpieces, a second portion which is unthreaded, and a third threaded portion extending from the second portion to the end of the shaft respectively,

means for forming a plurality of generally axial rotation resisting recesses arranged around the circumference of the shaft and along the second portion,

said nut having a first interior portion of axial length approximately the same as the second portion of the bolt shaft and having no threads therein so that said unthreaded first interior portion of the nut and said unthreaded second portion of the bolt shaft do not threadedly engage each other,

said nut having a second interior portion which is threaded for engaging the third threaded portion of the bolt shaft,

said nut further having a first exterior portion adjacent at the head end thereof and extending the same axial length along said nut as the second interior unthreaded portion of the shaft, said nut first exterior portion being polygonal in cross section, and a second exterior portion extending from the first portion to the other end of the nut, said said second portion having a cross section smaller than said first nut exterior portion, said nut being constructed for being driven up to specification load and thereafter swaged into intimate contact with the recesses of the bolt shaft by a nut driver,

said nut driver having a bore therein for accepting the nut, said bore having a first section extending from one end the same axial length as the first exterior portion of the nut and having an internal cross section larger than the nut, and a second section extending from the first section inwardly, said second section being circularly cylindrical and larger than the second section of the nut so as not to engage the same,

swaging means embedded in the sidewall of the interior of the driver first section for engaging at least two faces of the first exterior portion of the nut so that the driver can take up on the bolt shaft until the respective threaded portions and shaft are cooperatively and fully engaged and the nut abuts and clamps the workpiece with said predetermined force,

thereafter further turning of the driver deforms the material of the first section of the nut into the grooves of the second section of the shaft of the bolt, continuing turning of the driver causing the swaging means to deform each of the nut apexes in turn until the driver turns freely and can be thereafter removed for reuse,

said driver rotational motion being the sole mechanism for taking up the nut to specification tightness and for deforming the nut securely into the bolt shaft.

2. A removable fastener system for passing through holes in workpieces comprising

a bolt having a head at one end and a shaft extending from the head and threaded over a portion of its length,

a nut having a head end and a threaded bore therethrough for engaging the threaded part of the bolt shaft,

said bolt and nut being constructed and arranged for clamping workpieces tightly together permanently under a predetermined a clamp-up load when the nut is taken up on the bolt,

said bolt shaft having a first portion thereof next to said head for passing through the workpieces,

a second portion which is unthreaded, and a third threaded portion extending from the second portion to the end of the shaft respectively,

said bolt shaft further formed with a plurality of generally axial rotation resisting recesses arranged around the circumference of the bolt shaft and along the second portion,

said nut having a first interior portion of axial length approximately the same as the second portion of the bolt shaft and having no threads therein so that said unthreaded first interior portion of the nut and said unthreaded second portion of the bolt shaft do not threadedly engage each other,

said nut having a second interior portion which is threaded for engaging the third threaded portion of the bolt shaft,

said nut further having a first exterior portion adjacent the head end thereof and extending the same axial length along said nut as the second interior unthreaded portion of the bolt shaft, said nut first exterior portion having driver engaging surfaces including a flat and apexes, and a second exterior portion extending from the first portion to the other end of the nut, said second portion having a cross section smaller than said first nut exterior portion,

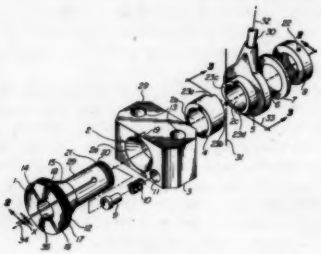
whereby said bolt and nut can be taken up to specification by a rotatable nut driver having swaging means embedded in the sidewall thereof for engaging the flat of the first exterior portion of the nut so that the driver can take up the nut on the bolt shaft until the respective threaded portions and shaft are cooperatively and fully engaged and the nut abuts and clamps the workpiece to the bolt head with said predetermined force, thereafter further turning of the driver causes the swaging means to deform and swage the material of the first section of the nut into the recesses of the second section of the shaft of the bolt, and continuing turning of the driver causing the swaging means to deform each of the nut apexes in turn until the driver turns freely and can be thereafter removed for reuse, said driver rotational motion being the sole mechanism for taking up the nut to specification tightness and for deforming the nut into the bolt shaft to secure the same.

4,682,521

QUICK CHANGE, ADJUSTABLE TOOL HOLDER

Oswaldo A. Duenas, 13711 Olympic Ave., Costa Mesa, Calif. 92626

Filed Feb. 10, 1986, Ser. No. 827,951
Int. Cl.[4] B23B *29/04*
U.S. Cl. 82—36 R **5 Claims**



1. A quick change, adjustable tool holder comprising:

a manually adjustable collet tool holder, said collet having a multiplicity of longitudinal slots, a manually adjustable knurled flange, a straight barrel section terminating at the end opposite said flange in a shoulder and threading means, and a bore for holding a tool eccentric to said barrel;

said collet held rotatably in a body block with said block further comprising a fastening means to a machine tool rest, and an internal, fixed cam surface concentric with said barrel;

said fixed cam surface cooperatively engaged with a mating, rotatable concentric cam surface integral with a collar concentrically surrounding said barrel and penetrating said body block;

said collar and said collet being held in a rotatable assembly in said body block by a locking ring secured against said shoulder by said threading means on said end of said collet, said collar having a handle attached thereto;

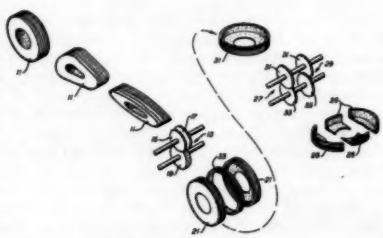
whereby rotating said rotatable cam surface by means of said handle attached to said collar in cooperative engagement with said fixed cam surface opens said collet to allow manual adjustment of said collet or closes said collet to fix the position of said collet.

4,682,522

SHEARING METHOD AND MACHINE FOR SEGMENTING SCRAP TIRES

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Filed Oct. 29, 1986, Ser. No. 924,289
Int. Cl.[4] B26D *7/06, 7/08*
U.S. Cl. 83—19 **21 Claims**



1. An apparatus for shearing tires comprising,

compression means for exerting a flattening force on a circumferential periphery of a tire,

first shearing means communicating with said compression means for receiving a flattened tire therefrom and having at least two rotary mounted circular shears disposed to shear the flattened tire about the circumferential periphery to form at least two annular tire segments, and

second and third shearing means communicating with the first shearing means adapted to accept an annular tire segment therefrom, said second and third shearing means sharing a parallel pair of common axes and each having a pair of counterrotating shears disposed to shear said annular tire segment perpendicular to an axis extending through the center of the tire segment, the third shearing means spaced apart from the second shearing means by a distance less than the outer diameter of said annular tire segment, said second and said third shearing means combining to shear an annular tire segment into four arcuate parts.

19. A method of shearing automotive tires of the type having tread about a circumferential periphery and a center defining a tire axis comprising,

flattening a tire by circumferential pressure thereby bringing opposed tread regions into proximity,

shearing the flattened tire about its circumferential periphery, thereby forming two annular tire sections, and

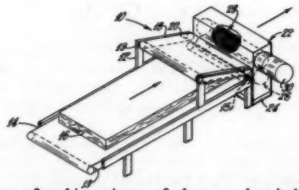
shearing each annular tire section into at least two pieces by cutting across the tire tread.

4,682,523

METHODS OF MAKING GLASS WOOL BLOWING INSULATION

Alan R. Johnson, Sylvania, and Richard C. Yawberg, Grand Rapids, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 697,698, Feb. 4, 1985, abandoned, which is a continuation of Ser. No. 532,880, Sep. 16, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,484
Int. Cl.[4] B26D *7/08*
U.S. Cl. 83—19 **1 Claim**



1. A process of making pieces of glass wool, suitable to be blown into attics as thermal insulation, from an elongated generally laminar resiliently compressible glass wool blanket having an original thickness in an unrestrained condition and being made of glass fibers bonded with thermoset resin, said process comprising feeding the blanket longitudinally through a compressing station wherein it is resiliently compressed from its original thickness to a smaller thickness, and feeding the compressed blanket longitudinally between a rotating backup roll and a cooperative rotating cutting roll from one side of the rolls, the cutting roll including a supporting cylinder, a plywood blade-mounting cylinder mounted on the supporting cylinder, a plurality of circular cutting blades each having a plurality of shank portions spaced from each other and disposed substantially completely around an inner periphery of the blade, a plurality of straight cutting blades each having a plurality of shank portions spaced from each other and disposed substantially completely along a length of the blade, and a plurality of resiliently compressible plugs, the circular cutting blades respectively being separately mounted on the plywood cylinder circumferentially thereof, being distributed

substantially throughout the length thereof, being spaced equally from each other axiallly thereof by a distance smaller than said original thickness of the blanket, and having their shank portions mounted respectively in slits extending substantially all the way through a wall thickness of the plywood cylinder, the straight cutting blades respectively being separatedly mounted on the plywood cylinder axially thereof, being distributed throughout the circumference thereof, being spaced equally from each other circumferentially thereof by a distance smaller than said original thickness of the blanket, having their shank portions mounted respectively in slits extending substantially all the way through the wall thickness of the plywood cylinder, and being arranged in a crossing and interlocking relationship with the circular cutting blades, and the resiliently compressible plugs being mounted on the plywood cylinder, being disposed respectively in spaces defined by the cutting blades, and having outer surfaces radially within but substantially flush with cutting edges of the blades, whereby the compressed blanket is cut into columns, the columns are compressed respectively against the resiliently compressible plugs and confined temporarily in the spaces defined by the cutting blades and radially within the cutting edges of the blades, and the plugs are compressed against the plywood cylinder as the blanket passes between the backup roll and the cutting roll, and the columns are expelled from the cutting roll by the resiliently compressed plugs upon passing to the other side of said rolls, the spacing of the circular cutting blades from each other and the spacing of the straight cutting blades from each other being sufficiently small to provide columns sufficiently slender as to delaminate, due to their laminar structure, into smaller pieces at random upon being conveyed away from said rolls.

4,682,524

APPARATUS FOR CUTTING STACKS OF FLAT WORKPIECES

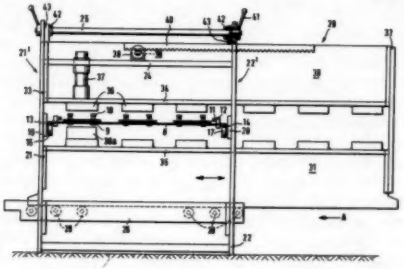
Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,330

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432385

Int. Cl.⁴ B26D *5/02*; B26F *1/04*

U.S. Cl. 83—151 **5 Claims**



1. Apparatus for cutting stacks of flat workpieces, particularly of making undershirt-shaped bags from stacked tubular film sections made of thermoplastic material and formed with side gussets and with top and bottom end seam welds, said apparatus comprising: a machine frame, a carriage movably supported in the machine frame, punch-and-die sets mounted in the carriage and including punches associated with drive means for moving said punches up and down when some of said punch-and-die sets are operated, and die plates fixed to the carriage for cooperation with the punches, a movable conveyor carried by the machine frame for intermittently feeding the stacks between and for removing them from the punches and dies, a plurality of punch-and-die sets and punch drive means arranged in a row in the carriage, guide means for guiding the carriage for reciprocation in the machine frame in a direction which is laterally transverse to the direction of travel of the conveyor, and securing means for securing the carriage in one of two operating positions in the machine frame,

at least one of said plurality of punch-and-die sets is in an operating position and is operated within the machine frame while at least one other of said plurality of punch-and-die sets protrudes laterally from and outside the machine frame so that they can be replaced or reground.

4,682,525

HYDRAULIC SAW FRAME WITH EXTERNAL SEALING MEANS

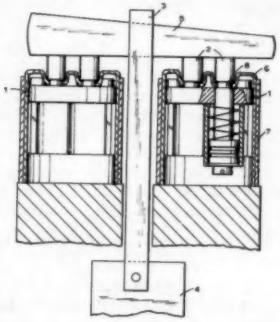
Roettger Jansen-Herfeld, Remscheid, Fed. Rep. of Germany, assignor to Richard Jansen GmbH, Remscheid, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 856,772

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514728

Int. Cl.⁴ B27B *3/34*

U.S. Cl. 83—751 **4 Claims**



1. A hydraulic saw frame including a frame body, a movable member supporting one end of at least saw blade, at least one stretching device arranged on said frame body and including a plurality of hydraulic cylinder and piston units arranged in a row to act on said movable member, and elastic sealing sheet enclosing all cylinder and piston units of said stretching device, said sealing sheet having a center portion secured to respective pistons of said hydraulic units and a peripheral portion secured to said frame body, said sealing sheet being elastically deformable over the length of displacement of said pistons.

4,682,526

ACCOMPANIMENT NOTE SELECTION METHOD

Robert J. Hall, 20756 Tribune St., Chatsworth, Calif. 91311; George R. Hall, 13613 Huston St., Sherman Oaks, Calif. 91423, and Jack C. Cookerly, 26916 Barbacoa Pl., Saugus, Calif. 91350

Continuation-in-part of Ser. No. 274,606, Jun. 17, 1981, Pat. No. 4,508,002. This application Jun. 15, 1984, Ser. No. 621,326

Int. Cl.⁴ G10F *1/00*

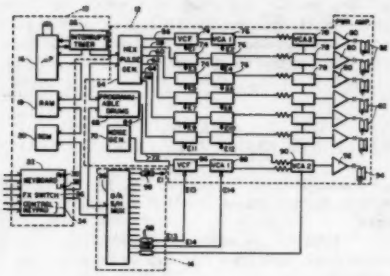
U.S. Cl. 84—1.03 **19 Claims**

5. In a method for providing musical accompaniment in response to the playing of an accompaniment-type musical instrument, the improvement comprising the steps, accomplished by the instrument itself, of:

storing a plurality of possible voicings of an accompaniment chord, each of said voicings being representative of an ordered group of notes;

defining a preselected acceptable tonal range for the notes of said voicings;

determining which of said voicings have notes which fall within the acceptable range;



randomly selecting one of the voicings from those having notes which fall within the acceptable range;

and sounding the chord according to the selected voicing.

4,682,527

PEG DROPS

Michael J. Pagliaro, 219 Sprain Rd., Scarsdale, N.Y. 10583

Filed Dec. 10, 1986, Ser. No. 940,104

Int. Cl.[4] G10G *7/00*

U.S. Cl. 84—305 **4 Claims**

1. Peg drops for stringed musical instruments comprising 300–600 ml. of isopropyl alcohol, 100–199 ml. of tincture of green soap, 100–199 ml. of glycerin and between 21 and 43 g. of violin rosin.

4,682,528

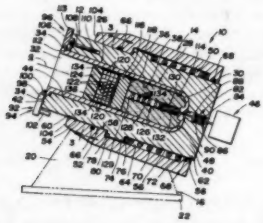
ACTIVE PROTECTION SYSTEM

Johann F. Wohler, Troy, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Filed Feb. 25, 1985, Ser. No. 704,665

Int. Cl.[4] F41F *1/00, 19/00, 19/14*

U.S. Cl. 89—1.3 **10 Claims**



1. An active protection system comprising: a support a launch tube mounted on the support for recoil movement relative to said support; said launch tube having a closed rear end and an open muzzle end; said launch tube having a round inner bore that has a slight inward taper for substantially the entire distance from the open muzzle end thereof to the closed rear end to facilitate loading of a cartridge having a case with an outer surface that tapers inwardly from an open muzzle end thereof to a closed rear end of the case; a firing mechanism at the closed rear end of the launch tube for firing a cartridge loaded in the launch tube; a recoil mechanism for controlling recoil movement of the launch tube on the support; and a support cartridge control mechanism at the open muzzle end of the launch tube for securing the loaded cartridge in the launch tube prior to firing and for releasing and ejecting the fired cartridge in response to recoil movement of the launch tube upon firing.

8. An active protection system comprising: a support; a launch tube mounted on the support for recoil movement relative to said support; the launch tube having a closed rear end of a rounded shape and an open muzzle end; the launch tube having a round inner bore that has a slight inward taper for substantially the entire distance from the open muzzle end thereof to the closed rear end to facilitate loading of a cartridge having a case with an outer surface that tapers inwardly from an open muzzle end thereof toward a closed rear end of the case; a fluid dampened spring recoil mechanism for controlling recoil movement of the launch tube on the support; a firing mechanism at the closed rear end of the launch tube for firing a cartridge loaded in the launch tube; and a cartridge control mechanism at the open muzzle end of the launch tube for securing the cartridge in the launch tube prior to firing and for releasing and ejecting the fired cartridge in response to recoil movement of the launch tube upon firing.

4,682,529

MODULAR DEVICES FOR LOADING CARTRIDGES ON BOARD AIRCRAFT

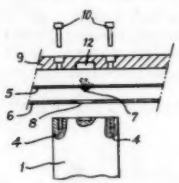
Didier A. Duclos, Maisons Alfort, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Dec. 6, 1984, Ser. No. 678,856

Claims priority, application France, Dec. 7, 1983, 83 19579

Int. Cl.[4] F41F *5/02*

U.S. Cl. 89—1.51 **5 Claims**



1. A modular device for carrying by an aircraft load launching cartridges, such cartridges each having a base provided with threaded holes for its securing and electric detonators for initiating the load ejection, said modular device comprising:

(a) a box with internal dividing walls which define housings for the cartridges said box bearing means for its quick securing to the aircraft;

(b) an insulating plate rigid with said box and disposed along the cartridge bases, said insulating plate having holes formed to register with said electric detonators of the cartridge bases;

(c) a printed circuit disposed along said insulating plate, this printed circuit having resilient contact studs adapted to engage said electric detonators through said holes of the insulating plate;

(d) a support for a coding circuit, connected to said printed circuit and receiving a removable coding element;

(e) a connector adapted to connect said printed circuit to an electronic control equipment of the aircraft;

(f) a support plate provide with holes registering with said threaded holes of the cartridge bases and recesses for clearing said contact studs of the printed circuit; and

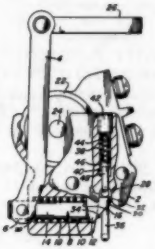
(g) fixing bolts adapted to pass through the holes of the support plate and of the cartridge bases for pressing said insulation plate and said printed circuit between the cartridge bases and the support plate.

4,682,530

AIRBORNE STORES ARMING TRIGGER UNIT AND METHOD OF PREVENTING UNDESIRED ARMING

James R. Brown; Gary S. Lane, and Wallace H. Larson, all of Jamestown, N. Dak., assignors to Western Gear Corporation, Jamestown, N. Dak.

Filed May 30, 1986, Ser. No. 869,390
Int. Cl.[4] F41F 65/02; F14F 5/02
U.S. Cl. 89—1.55 16 Claims



12. A method of preventing the undesired release of an armed airborne store having an arming lanyard with a loop encircling a lanyard pin which pin is movable between and into latched and unlatched positions with respect to such loop comprising,

biasing a member for movement in a direction transversely of the path of movement of such a lanyard pin,

moving said member into a position to prevent said pin from returning to the latched position thereof once said pin has moved out of the latched position,

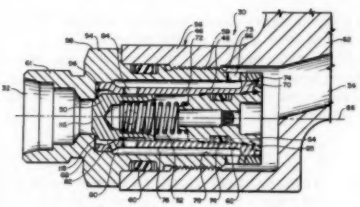
and reestablishing the bias on said member while permitting said pin to move into the latched position thereof.

4,682,531

APPARATUS AND METHOD FOR REGULATING THE RATE OF CHANGE OF FLOW OF A FLUIDIZED MEDIUM

John D. Mayer, King County, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1985, Ser. No. 815,369
Int. Cl.[4] F15B 11/08, 13/04
U.S. Cl. 91—446 17 Claims



1. A control valve for controlling a rate of change of fluid flow from a fluid source to hydraulic motor means to prevent the motor means from exceeding a maximum acceleration rate during start up, said control valve comprising:

a. a valve body having an inlet in communication with said fluid source, an outlet in communication with said motor means, and first and second passageways in communication with said outlet;

b. flow limiting means including a flow control member biased in a manner to restrict the flow of fluid to said outlet through said first and second passageways, said flow control member movable in a first direction against said bias in response to a pressure differential between said inlet and said outlet to communicate said inlet with said first passageway in a manner to allow a predetermined rate of fluid flow through said first passageway which causes said motor means to accelerate to a first speed at a rate which does not exceed said maximum start up acceleration rate; and

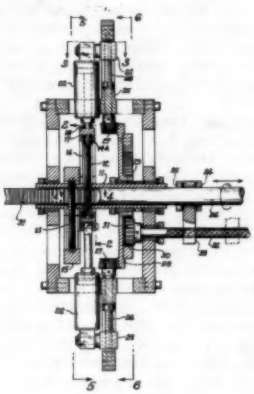
c. said flow control member being movable further in said first direction at a controlled rate in response to an increase in said pressure differential to communicate said inlet with said second passageway after said motor means has accelerated to said first speed, in a manner that a rate of fluid flow from said inlet through said second passageway to said outlet increases in response to said further movement of said flow control member in said first direction to cause said motor means to accelerate from said first speed to a second speed at a rate which does not exceed said maximum start up rate.

4,682,532

VARIABLE-STROKE CONSTANT-COMPRESSION-RATIO REVERSIBLE RADIAL PUMP

Erik E. Erlandson, 12814 Amaranth Street, San Diego, Calif. 92129

Filed Jan. 7, 1985, Ser. No. 689,367
Int. Cl.[4] F01B 31/14
U.S. Cl. 92—13.7 4 Claims



1. A variable-stroke reversible pump comprising:

a variable-throw eccentric comprising a tubular input shaft having a diametrical threaded hole, a threaded splined adjustment shaft which is screwed into the threaded hole in said input shaft, a hollow connecting-rod journal moving in a plane perpendicular to said tubular input shaft, having bearing races which are anchored at diametrically opposed points in said journal, said bearing races mounting the opposite ends of said adjustment shaft;

a slidable rack gear mounted within said tubular input shaft and operating on the splines of said adjustment shaft for rotating said adjustment shaft while said variable-throw eccentric moves in continuous angular motion;

at least one piston mounted slideably in a closed-fitting cylinder capped by a cylinder head; and

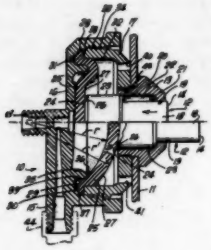
a connecting rod coupling said piston to said connecting-rod journal.

4,682,533

VANDAL RESISTANT AND TAMPER PROOF PNEUMATIC PUSH BUTTON ASSEMBLY FOR MOVING A VOLUME OF FLUID

V. Walter Hafner, Whittier; Ron T. Haha, Fullerton, and Keith D. Marshall, Whittier, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 28, 1986, Ser. No. 823,393
Int. Cl.[4] F01B *19/00*; F16J *3/00*
U.S. Cl. 92—98 R **29 Claims**



1. A push button assembly mounted in a wall for moving a volume of fluid out of and into a port, said assembly comprising:

a housing having at least one port for the passage of fluid, said housing having a circular ridge formed on the floor thereof, said circular ridge surrounding a floor area and having a sealing surface located on the exterior of the circular ridge and a sealing groove formed about the periphery of the circular ridge, and said port having an inner terminus which is located in said floor area;

a diaphragm sealing element affixed to said housing, said diaphragm sealing element having a circular, pressure-applying surface located about the periphery of said circular ridge;

a rubber, circular, domed diaphragm mounted in said housing, and the base of said diaphragm lying along the outer periphery of said circular ridge, and said diaphragm having an outwardly extending contact ring and a downwardly extending sealing ridge, the outer periphery of the contact ring being surrounded by the housing and the circular pressure-applying surface of the diaphragm sealing element and the domed portion of said diaphragm positioned above the floor area, said diaphragm having sufficient thickness so that although it is deformable, it readily returns to its original shape and wherein said housing has two additional circular sealing surfaces in addition to the sealing surface on the circular ridge, said additional sealing surfaces being positioned around the periphery of the circular ridge, the first sealing surface being directly adjacent the outer edge of said ridge and facing upwardly and the second sealing surface being formed about the exterior of the first sealing surface and at a higher level, also facing upwardly, and wherein the outwardly extending contact ring of said diaphragm is positioned on the upper surface of the second sealing surface, and the downwardly extending sealing ridge of the diaphragm fitting within the sealing groove of the housing so that an airtight seal is formed at the contact ring;

a wall for mounting the push button assembly, said wall having an inner surface and an outer surface, said wall having a hole formed therein;

an escutcheon member affixed to said housing, said escutcheon member having a widened escutcheon portion which abuts the outer surface of the wall, said escutcheon member having a chamber for housing a push button member and having a passageway extending through the escutcheon portion; and

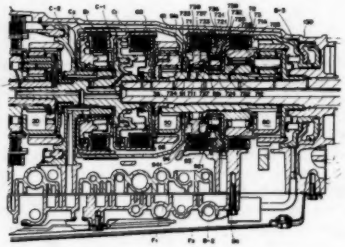
push button means having a piston portion held in the chamber of said escutcheon member, the terminal portion thereof contacting the domed diaphragm and a button portion which extends through the passageway of the escutcheon member to permit the operation thereof from the outer surface of the wall, whereby when the button portion is pushed, the terminal portion of said push button means depresses said domed diaphragm forcing the fluid within said dome through the port, and when said button is released, said domed diaphragm returns to its original shape thereby pulling fluid back in through said port.

4,682,534

HYDRAULIC SERVO FOR FRICTION COUPLING ELEMENT OF AUTOMATIC TRANSMISSION

Koji Sumiya, Nishio; Takenori Kano, Anjo; Seitoku Kubo, and Kazuaki Watanabe, both of Toyota, all of Japan, assignors to Aisin-Warner Limited and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Jul. 29, 1985, Ser. No. 759,826
Claims priority, application Japan, Jul. 31, 1984, 59-161897
Int. Cl.[4] F01B *31/00*
U.S. Cl. 92—130 R **2 Claims**



1. A hydraulic servo for a friction coupling element in an automatic transmission including a casing, said hydraulic servo, comprising:

an annular drum having a first cylinder, a second cylinder, and a side wall connecting said first and second cylinders all integrally formed together as a single piece by press forming, said first cylinder having a plurality of splines on its outer cylindrical surface and being fixed to the interior of the casing through said splines and said second cylinder having a plurality of splines on its inner cylindrical surface;

a press-formed third cylinder joined to the side wall of said annular drum by a fully encircling weld;

a piston fitted between said first cylinder and said third cylinder; and

biasing means provided between said third cylinder and said second cylinder for returning said piston.

4,682,535

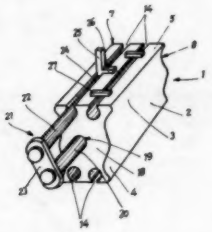
GUIDE HOUSING FOR THE LINEARLY MOVING OUTPUT ELEMENT OF A CYLINDER ACTUATOR

Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,680
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411823
Int. Cl.[4] F16J *15/18*
U.S. Cl. 92—165 PR **8 Claims**

1. A guide housing and linearly drivable element adapted for connection with a load, comprising: a cylindrical barrel forming part having a cylindrical barrel bore extending axially therethrough, at least one pedestal platform body running along the axial length of said barrel forming part and made as one piece therewith, a piston movable axially in said barrel

bore, said barrel forming part being joined to said pedestal platform body by a transition, said transition representing a waist of said pedestal platform body such that an outer face of said cylindrical barrel forming part is convexed over said barrel bore and said waist is concave, a piston rod connected to said piston and extending out of said barrel forming part, said pedestal platform body having a groove extending axially



therein parallel to said barrel bore, said groove being open to the outer face of said pedestal platform body along the axial length of said pedestal platform body, a guide rod extending in said groove and parallel to said piston rod, said guide rod being fixed to said piston rod for movement with said piston rod, and a strut fixed to said guide rod and slideable along said opening of said groove for movement along said groove with movement of said guide rod and piston rod.

4,682,536

ARRANGEMENT FOR DETERMINING AMBIENT TEMPERATURE IN A MOTOR VEHICLE

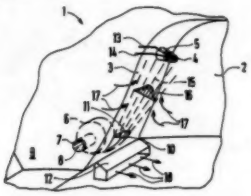
Peter Nolting, Buehlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,243

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504842

Int. Cl.⁴ B60H *1/00*

U.S. Cl. 98—2.01 **13 Claims**



1. An arrangement for determining ambient temperature in a compartment of a motor vehicle including a regulated source of heated air, the source communicating with the compartment through a first duct, comprising an air blower for sucking air from the compartment at a location remote from said first duct and blowing an air stream into the compartment through a second duct, and a temperature sensor arranged in said air stream at a relatively large distance from said first and second ducts.

4,682,537

COFFEE MAKING APPARATUS INCORPORATING METERED DISPENSING

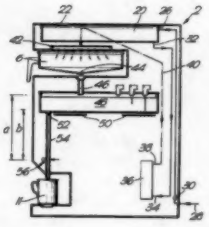
Malcolm R. Snowball, St. Leonards-on-Sea, and Cecil Hayes, Hastings, both of England, assignors to W. M. Still & Sons Limited, East Sussex, England

Filed Oct. 10, 1985, Ser. No. 786,211

Claims priority, application United Kingdom, Mar. 27, 1985, 8507974

Int. Cl.⁴ A47J *31/00*

U.S. Cl. 99—282 **6 Claims**



1. An apparatus for making tea and coffee beverages, said apparatus including coffee and tea infusing means, a beverage storage tank arranged to receive a beverage formed in said infusing means, said tank having a bottom outlet, a beverage dispensing outlet positioned below said tank outlet, a flexible conduit connected to said tank outlet and extending to said beverage dispensing outlet and beverage dispensing control means, said control means comprising a pair of abutments spaced apart and positioned on one side of said flexible conduit, a control member normally positioned intermediate said abutments adjacent to and on another side of said flexible conduit and being movable into a portion of the space separating the said two abutments so as thereby to compress one side of the dispensing conduit against the other side of the dispensing conduit and to deflect the said conduit through an arcuate path, and means operable on said control members whereby the dispensing conduit is either fully open or fully closed.

4,682,538

PROCESSING OF CURD

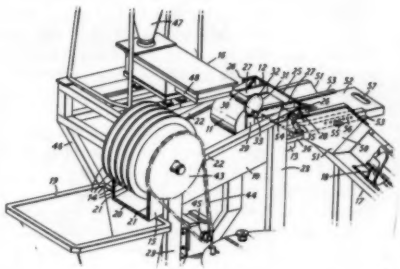
Alfred Zahlaus, Modena, Italy, assignor to Alfa-Laval Cheese Systems Limited, Somerset, England

Filed Nov. 5, 1985, Ser. No. 795,312

Claims priority, application Italy, Nov. 9, 1984, 23512 A/84

Int. Cl.⁴ A01J *25/00*

U.S. Cl. 99—453 **12 Claims**



1. Apparatus for processing curd in the manufacture of cheese by the addition of salt to curd, which comprises a trough having a base for supporting a moving stream of curd having a width substantially equal to the width of said trough

and a variable depth, a roller, inserted above said curd stream, bearing upon the surface of said stream and rotatable by movement of said stream, means for providing a first signal corresponding to the height of the roller above the base of the trough and therefore to the depth of the curd stream, means for providing a second signal corresponding to the rotational speed of said roller, dispensing means for dispensing salt into said curd stream and means responsive to said two signals for regulating the rate at which salt is dispensed from said dispensing means.

4,682,539

CAN CRUSHER

Earl C. Bramblett, 705 Bullett Ave., SE., Roanoke, Va. 24013, and Warren E. Clem, Rt. 1, Box 887, Vinton, Va. 24179

Filed Jul. 29, 1981, Ser. No. 287,904
Int. Cl.[4] B30B *9/32*
U.S. Cl. 100—265 **1 Claim**

1. A manually operated device specifically for compacting aluminum throw-away beverage cans, the device comprising:

a relatively heavy tramping element made of cast iron and having a top portion and a substantially planar, circular bottom surface; wherein the bottom surface is used for crushing cans upon application of a manually applied vertical impulse to the tramping element, wherein the bottom surface has a diameter approximately twice that of the beverage cans, and wherein there is a lateral groove extending across the bottom surface for venting air from cans that are crushed; the tramping element further having a projecting sleeve extending from the top portion, which projecting sleeve defines a socket that projects down into the tramping element in a direction normal to the planar surface, aligned holes through the sleeve communicating with the socket for inserting fastening pins;

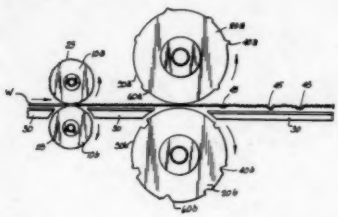
an elongated wooden handle having a connecting end secured in the socket of the tramping element and extending perpendicular to the planar bottom surface of the tramping element, in a direction away from the planar bottom surface, pin-type fastening means extending through the holes and through the elongated wooden handle to fasten the handle to the tramping element, said elongated handle having a free end opposite said connecting end, which free end is held in one hand of the person using the device to suspend the tramping element over singular cans, whereby the weight of the tramping element suspended by the elongated handle has a plumb-line effect which positions the tramping element over the can thereby helping to aim the tramping element and to insure that the manual impulse applied has an almost completely vertical force component.

4,682,540

METHOD FOR EMOBSSING A NON-REPEATING DESIGN

Robert J. Eastman, and Mark P. Tandy, both of Littleton, Colo., assignors to Manville Corporation, Denver, Colo.

Filed Jun. 12, 1986, Ser. No. 873,571
Int. Cl.[4] B44B *5/00*
U.S. Cl. 101—32 **7 Claims**



1. A method for producing a non-repeating design on a web of material, said method comprising:

providing a first and second pair of opposed rollers, each pair having an embossing pattern on the surface of at least one roller,

passing the web of material between the first pair of rollers and then between the second pair of rollers, the first pair of rollers embossing a repeating pattern on the web and the second pair of rollers reembossing portions of the web; and

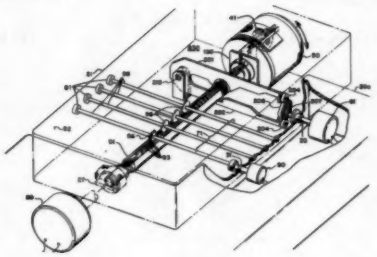
varying the speed of rotation of the second pair's embossing rollers while maintaining the speed of rotation of the first pair's embossing rollers constant such that said repeating pattern is interrupted and said non-repeating design is produced.

4,682,541

POSTAL MAILING SYSTEM HAVING AN ADAPTABLE POSTAGE METER

Philip Pollak, Jr., Westport, and Keith E. Schubert, West Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 592,679, Mar. 23, 1984, abandoned. This application Nov. 7, 1985, Ser. No. 798,343
Int. Cl.[4] B41L *47/46;* B41J *1/20*
U.S. Cl. 101—91 **2 Claims**



1. A postal metering system comprising a postage meter adapted to be connected to a low-speed mailing machine wherein the low-speed mailing machine includes one receiving member extending outwardly from its surface, the low-speed mailing machine having means for controlling the one receiving member, the postage meter of this system comprising; a print drum member, a plurality of rotatable print value members located within the drum member, a rod member extending into the drum member, the rod member having a plurality of

rack members located axially therein, the rack members being located within the same longitudinal plane, one end of the rack members engaging each of the value members, a plurality of crossover shaft members extending perpendicularly across the rod member, each of the plurality of shaft members having a gear located therein, each gear engaging one of the plurality of rack members, one of the shaft members engaged by the one receiving member of the mailing machine receiving member when the postage meter is attached to the low-speed mailing machine, the controlling means comprising means for rotating the drum member to align each rack member with the gear being actuated by the one receiving member for serial setting of the print value members.

4,682,542

WATER FOUNTAIN FOR A DAMPENING UNIT

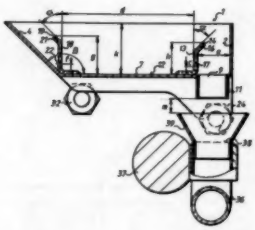
Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 860,978

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519294

Int. Cl.[4] B41F *7/32*

U.S. Cl. 101—148 **9 Claims**



1. A removable water fountain and dampening unit for an offset rotary printing machine, said water fountain and dampening unit comprising:

a front wall, a rear wall and spaced side walls, said front, rear, and side walls extending generally upwardly from a floor to define a dampening fluid receiving reservoir in said removable water fountain;

spaced, generally parallel inlet and outlet dams extending between said spaced side walls;

means for supplying dampening fluid to said water fountain reservoir from a dampening fluid circulation system and means for returning unused dampening fluid to said dampening fluid circulation system from said fountain reservoir, said means for supplying said dampening fluid to said water fountain reservoir including a dampening fluid inlet feed line positioned above, and spaced from said water fountain reservoir, said means for returning said unused dampening fluid from said water fountain reservoir to said dampening fluid circulation system including a drainage tube secured in said floor of said water fountain;

a drainage pipe in said dampening fluid circulation system, said drainage pipe having a funnel in an opening thereof, a mouth portion of said funnel being positioned beneath, and spaced from said drainage tube to receive said unused dampening fluid from said drainage tube and to return said unused dampening fluid to said dampening fluid circulation system, said funnel and said drainage pipe being of greater cross section at all points that an outlet cross section of said draingage tube; and

means for supporting said removable water fountain in said offset rotary printing machine for quick, connection free removal and reinstallation of said water fountain in said dampening unit.

4,682,543

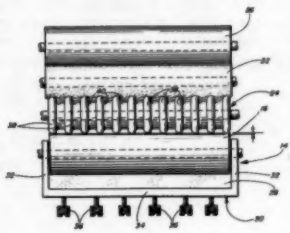
INK OR MOISTURE ROLLER FOR DUPLICATING MACHINES

Stanley Witczak, Chicago, and Earl L. Gasner, Schaumberg, both of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Dec. 9, 1985, Ser. No. 806,793

Int. Cl.[4] B41F *31/06, 31/26*

U.S. Cl. 101—350 **5 Claims**



1. An ink feeding system for a duplicating machine comprising, in combination, an ink fountain having a fountain roller rotatable in the fountain, a transfer roller journalled parallel to the fountain roller and spaced therefrom, and a pickup roller journalled parallel to the fountain and transfer rollers with the surface of the pickup roller in contact with the transfer roller and slightly spaced from the fountain roller, said surface being formed by a plurality of spaced circular ribs defining a pattern of generally parallel ridges and valleys along the pickup roller normal to the axis thereof, said ribs being on the order of 0.010 inch high and 0.125 inch wide, with the ribs spaced on the order of 0.125 inch.

4,682,544

CHEMILUMINESCENT LIGHT CONTAINER

Anthony Koroscil, Escambia; Walter A. Smithey, Santa Rosa, both of Fla., and Paul A. Delgado, Oxnard, Calif., assignors to American Cyanamid Company, Stamford, Conn. and Del Manufacturing, Oxnard, Calif.

Filed Dec. 26, 1985, Ser. No. 813,344

Int. Cl.[4] F42B *4/26*

U.S. Cl. 102—336 **6 Claims**

1. A hollow container adapted for insertion into a device for use in creating a signal and having fitted into the hollow space thereof ingredients, in the following sequence, consisting essentially of

(a) a fuse of percussion cap,

(b) a propellant,

(c) a chemiluminescent light activator solution,

(d) a chemiluminescent light fluorescer solution,

(e) a non-reactive enhancer capable of absorbing or adsorbing the reaction product produced upon contact of (c) and (d) which occurs upon detonation of said fuse or cap and

(f) a sealing means.

4,682,545

AMMUNITION ROUND

Thomas M. Jett, Jr., P.O. Box 167-B, R.R. 3, Litchfield, Ill. 62056

Filed May 13, 1986, Ser. No. 862,698

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—430 **3 Claims**

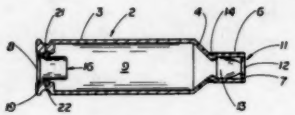
1. An ammunition round, comprising:

a re-usable one-piece cartridge casing including a cylindrical body portion, a tapered intermediate portion, and a narrower neck portion, said neck portion and said body portion defining a nose opening and a base opening respectively at opposite ends of said casing, said casing defining

an internal chamber extending longitudinally between said opposite ends;

said base opening having a groove formed in it;

a lead pellet including a flat nose portion and an integral concave skirt portion extending rearwardly therefrom, said skirt portion being of sufficient thickness to withstand the explosive force to be exerted thereon without separation and being sized in length and diameter to engage said cylindrical neck portion of said cartridge casing snugly with said flat nose portion adjacent said nose opening of said cartridge casing, said cartridge casing having two spaced substantially opposed displaced indentations formed in said casing wall adjacent the juncture of said



neck and tapered intermediate portion of said casing to provide a stop for the trailing edge of the skirt portion of said pellet; and

a cylindrical primer means having a protruding rim at the trailing end thereof, said cartridge casing having a recessed end defining said base opening to receive said protruding rim of said primer means, said cartridge casing having a peripheral groove disposed in the internal wall of the body portion thereof adjacent said base opening, and re-useable resilient O-ring disposed in said groove to engage said cylindrical wall of said primer means when disposed in said base opening, said O-ring sealing said primer and said cartridge and permitting easy insertion and removal of said primer means.

4,682,546

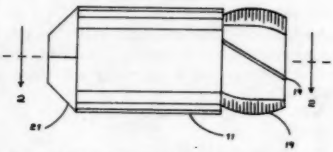
PROJECTILE

Milija M. Chovich, 141-5th Ave. N., So. St. Paul, Minn. 55075

Filed Oct. 2, 1986, Ser. No. 914,293

Int. Cl.[4] F42B *9/20*

U.S. Cl. 102—529 **1 Claim**



1. A projectile which will self-destruct at a predetermined range and which will not ricochet upon striking a solid object, said projectile comprising:

a hull having a slotted nose cone;

payload cavities formed within said hull, said payload cavities being filled with a liquid payload;

a plurality of rotors disposed within said payload cavities;

a retaining bolt extending at least part of the length of said hull through said payload cavities, said bolt extending through openings at the anterior and posterior ends of said hull;

a retaining nut disposed within said nose cone, said nut holding said shaft in position at the anterior end of said bolt;

two or more fins formed around a hub at the posterior end of said retaining bolt, said fins forming angles with the horizontal axis of said projectile such that said fins rotate more slowly than said hull, thus allowing said retaining bolt to unscrew from said retaining nut while said projectile is in flight.

4,682,547

AMUSEMENT RIDE WITH VEHICLES SUPPORTED BY UNIVERSALLY HINGED WHEEL GROUPS

Anton Schwarzkopf, Münsterhausen, Fed. Rep. of Germany, assignor to Firma Schwarzkopf GmbH, Munsterhausen, Fed. Rep. of Germany and Intamin Corporation, Vaduz, Liechtenstein

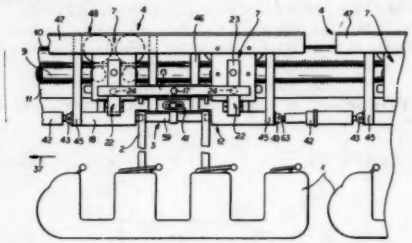
PCT No. PCT/EP84/00021, § 371 Date Oct. 1, 1984, § 102(e) Date Oct. 1, 1984, PCT Pub. No. WO84/03052, PCT Pub. Date Aug. 16, 1984

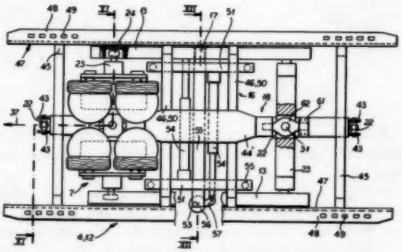
Continuation-in-part of Ser. No. 507,898, Jun. 24, 1983, Pat. No. 4,520,732. This PCT application Jan. 31, 1984, Ser. No. 667,472

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303279

Int. Cl.[4] B61B *3/00*; B61F *5/38*

U.S. Cl. 104—53 **12 Claims**





1. An amusement ride comprising:

rail means defining a closed travel path;

a plurality of carriages provided with running rollers and guide rollers riding on said rail means, each of said carriages comprising:

a respective carriage frame formed with longitudinal members running generally in a direction of travel of the carriage along said rail means, and transverse members extending transversely to said longitudinal members and connected thereto, said longitudinal members including at least one lower longitudinal member of a bridge configuration with a raised middle part, and

at least two wheel groups spaced apart along and affixed to the respective carriage frame and each provided with a common support and with respective sets of said running rollers and said guide rollers journaled on the respective support and riding on said rail means;

a respective passenger carrying vehicle connected to each of said carriages whereby each carriage is individual to one of said passenger carrying vehicle and each of said passenger carrying vehicles is carried by only one of said carriages;

a respective plurality of support rods suspending each of said passenger carrying vehicles from a respective one of said carriages;

articulation means including a shaft rotatable about a respec-

tive axis extending in said direction, and positioned below each said raised middle part for pivotally supporting at least a pair of said rods for swinging movement about the respective said axis extending in said direction, each of said pairs of rods being connected to said shaft; and

damping means including at least one linearly effective oscillation damper mounted on said frame, and means for transforming rotation of said shaft into linear displacement of said damper for damping oscillation of said vehicle about the respective said axis.

4,682,548

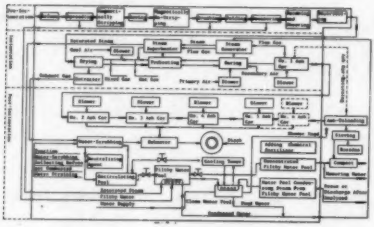
REFUSE DISPOSING METHOD AND THE APPARATUS THEREOF

Chen H. Peng, 2nd Floor, No. 36, Chi-Li 1st Street, Chung-Li City, Taoyuan, Hsien, Taiwan

Continuation-in-part of Ser. No. 550,397, Nov. 10, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 725,388

Int. Cl.[4] F23G *5/02*

U.S. Cl. 110—222 **27 Claims**



1. A refuse disposing method comprising the steps of:
(a) gathering the refuse at a first place;
(b) spreading said refuse from said place;
(c) magnetically stripping ferruginous materials from said refuse at step (b);
(d) sawing said refuse into smaller ones;
(e) magnetically restripping ferruginous materials contained in said refuse;
(f) crushing said refuse;
(g) folding said refuse;
(h) dewatering said refuse;
(i) re-sawing and shearing said refuse into smaller ones;
(j) evenly distributing said refuse at a said second place;
(k) burning said refuse at a combustion chamber with said refuse acting as fuels;
(l) drying said refuse at said second place by the heat generated in said combustion chamber;
(m) preheating said refuse before it is in said combustion chamber by the heat generated in said combustion chamber;
(n) oxidizing the difficult-to-oxidize residue in said refuse at a plurality of ash cars;
(o) water-scrubbing a flue gas obtained from said second place; and
(p) preparing a fertilizer by mixing together a water after used in step (o) and an ash obtained from said ash cars.

6. An apparatus for refuse disposing comprising:
a refuse gathering means for gathering therein a refuse;
a refuse spreading means for spreading said refuse from said gathering means;
a refuse magnetically stripping means for stripping ferruginous materials from said refuse from said spreading means;
a refuse burning means for burning said refuse;
said burning means includes:
a combustion chamber;
a chain grate stoker, mounted in said combustion chamber, for conveying said refuse for being burnt thereon;
a steam generator, mounted in said combustion chamber, for generating stem by the heat of the hot gas obtained from said combustion chamber;
said refuse gathering means is a hopper for receiving therein a refuse;
a drying means, for drying said refuse before it is preheated in said preheating chamber, which includes:
a drying chamber having an upper drying chamber connected to said preheating chamber and a lower drying chamber; and
a grate-like member disposed in said drying chamber for separating said upper and lower drying chambers, carrying said refuse thereon to be dried by said hot gas after which is used to generate said steam and preheat said refuse and having a plurality of openings for passing said hot gas from said upper drying chamber into said lower drying chamber.

4,682,549

METHOD AND AN ARRANGEMENT FOR PURIFYING AND RECOVERING HEAT ENERGY FROM FLUE GASES FROM REFUSE INCINERATION

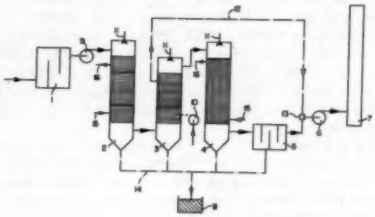
Lars Hall, Lidingö , Sweden, assignor to Ragn-Sellsforetagen AB, Sweden

Filed Jan. 21, 1986, Ser. No. 820,733

Claims priority, application Sweden, Jan. 23, 1985, 8500314

Int. Cl.[4] F23J *11/00*

U.S. Cl. 110—345 **6 Claims**



1. A method of purifying by cooling flue gases from refuse incineration and of recovering heat energy therefrom, wherein said cooling is carried out in three steps, comprising
a first step of cooling said flue gases with water within a first glass and plastic cooler means, said cooling in said first step being carried out at approximately 80° C.,
a second step of cooling the outflow of said first cooler with air within a second glass and plastic cooler means, said cooling in said second step being carried out at a temperature of substantially 55°–65° C. and close above the water dew point of the flue gas, said second step including varying the amount of air used for the cooling to be about 40% to 80% of the total volume of flue gas in dependence upon the period of the year, and of heating the resulting air to about 40°–50° C.,
a third stage of cooling the outflow of said second cooler with water within a third alloyed steel cooler means, wherein the flue gases are additionally cooled to about 35°–45° C. so as to heat the cooling water to about 30°–35° C.,
and transferring the heat energy of said cooling water to a district heating system by means of a heat pump.

4,682,550

HAND-HELD APPARATUS AND METHOD FOR LOOSENING, AERATING AND FERTILIZING SOIL PLANT ROOTS

Stanley E. Joy, 6611 W. 69th Way, Arvada, Colo. 80003

Filed Sep. 27, 1985, Ser. No. 780,973
Int. Cl.[4] A01C *15/02*
U.S. Cl. 111—7.1 **11 Claims**

1. An apparatus for treating the roots of plants, the apparatus comprising in combination:

(a) an upper generally cylindrical housing including a radial flange at the lower end thereof;

(b) first tubular means for insertion into a predrilled hole in soil near the roots of the plant for controllably conducting highly pressurized air into the predrilled hole to loosen the soil and produce voids and cracks therein said first tubular means including a downwardly tapered portion and an annular flange portion at the upper end thereof;

(c) means supported by said housing for controllably placing fertilizer or other chemical treatment material in the path of the highly pressurized air to allow the highly pressurized air to force the fertilizer or chemical treatment material through the first tubular means and into the voids and cracks;

(d) second tubular means for insertion into the predrilled hole simultaneously with the first tubular means for controllably conducting pressurized water or treatment liquid into the voids and cracks to dissolve the fertilizer or chemical treatment material in the voids and cracks, moisten the soil around the voids and cracks and carry dissolved nutrient or treatment chemicals to the roots before the apparatus is removed from the predrilled hole;

(e) means rigidly connecting the annular flange means on the upper end of the first tubular means to said housing radial flange, an annular plate means associated with said connecting means for supporting the entire weight of an operator in order to hold the first tubular means in the predrilled hole when the highly pressurized air is being conducted through the first tubular means into the bottom of the predrilled hole, said annular plate means also limiting the depth of insertion of the first tubular means into the predrilled hole and providing a sealing of the tapered portion on the first tubular means to the mouth of the predrilled hole; and

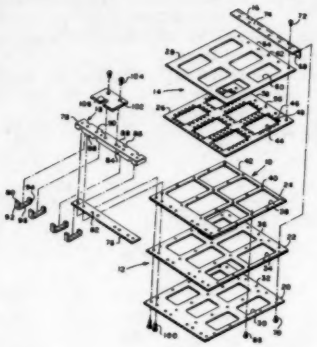
(f) means for supplying the highly pressurized air with sufficient pressure that and if the soil is sufficiently tightly packed and the operator stands on the operator weight supporting means, the highly pressurized air lifts the apparatus and the operator standing thereon slightly above the ground, releasing some of the air pressure, whereby the apparatus and operator thereon then fall downward until the annular plate means rests on the ground, re-sealing the mouth of the predrilled hole, thereby causing repetitive surging in the pressure of the highly pressurized air being forced into the soil, thereby effectively aiding in the loosening of the soil.

4,682,551

MULTI-EMBLEM CLAMPING DEVICE

George M. Toman, Chicago, Ill., assignor to Meistergram, Inc., Greensboro, N.C.

Filed Apr. 30, 1985, Ser. No. 728,927
Int. Cl.[4] D05B *31/00*; D06C *3/08*
U.S. Cl. 112—103 **4 Claims**



1. A device for holding material in registration during the sewing process comprising:

means for receiving the material to be held in registration, said receiving means supporting the material and having at least one aperture therein; and

means for grippingly engaging the material around the outer periphery thereof, said engaging means having at least one aperture therein in alignment with said at least one aperture in said receiving means permitting the passage of a sewing instrument therethrough during the sewing process, said engaging means including a plurality of projections directed inwardly toward the center of said at least one aperture therein, each of said projections having an end positioned substantially perpendicularly to the plane of said engaging means and engageable with the material, said plurality of projections being formed and positioned so as to apply a substantially even compressive force to the material.

4,682,552

DISPLACEABLE APPARATUS FOR PROCESSING PALLETS IN AN AUTOMATIC SEWING MACHINE

Donald F. Herdeg, South Hamilton, and Lawrence P. Ciccia, Medford, both of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 12, 1986, Ser. No. 873,741
Int. Cl.[4] D05B *21/00*; D05C *9/04*
U.S. Cl. 112—121.12 **11 Claims**

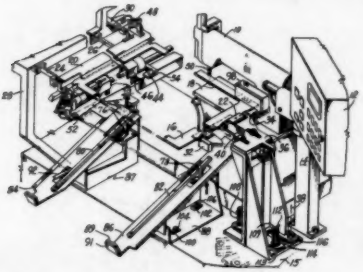
1. Apparatus for processing workpieces prearranged within pallets in an automatic sewing machine system, said apparatus comprising:

a set of means for receiving opposing edges of a pallet, at least one of said receiving means being rotatably attached to a structural mount, said structural mount being pivotally attached to a base of the automatic sewing machine system so as to allow said structural mount to be pivotally displaced from its normal position;

means, located below said set of receiving means, for automatically attaching a pallet, dropped from said receiving means, to a means for automatically positioning the prear-

ranged workpiece within the pallet relative to a sewing needle so as to produce a sewn workpiece;

means for dropping the front edge of the pallet containing the sewn workpiece from said means for automatically positioning the prearranged workpiece; and



means for receiving the dropped pallet whereby the dropped front of the pallet slides downwardly so as to allow the rear edge of the pallet to thereafter drop from said means for automatically positioning the prearranged workpiece.

4,682,553

SEWING MACHINE WORKPIECE EDGE ALIGNMENT APPARATUS

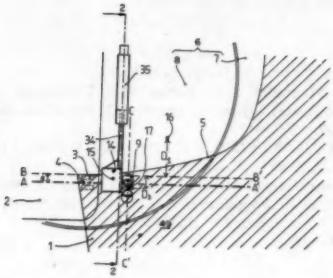
Jean-Marie Bachmann; Jacques Pion, both of St. Julien-les-Villas, and Jean-Pierre Raisin, Troyes, all of France, assignors to Institut Textile de France, Boulogne Billancourt, France

Filed Feb. 14, 1986, Ser. No. 829,836

Claims priority, application France, Feb. 21, 1985, 85 02519; Jul. 26, 1985, 85 11509

Int. Cl.[4] D05B *19/00, 27/14*

U.S. Cl. 112—121.12 **21 Claims**



1. In an installation for linear treatment of a workpiece, such as stitching, along a line of which the direction remains substantially parallel to an edge of a supple workpiece such as a textile piece, of the type comprising:

a fixed linear treatment machine having a fixed point of treatment, such as a sewing machine said machine including a feed dog and a presser foot;

a drive device for drawing said feed dog and presser foot for displacing, with respect to the treatment machine, the zone of the workpiece being treated, along a predetermined line axis of treatment;

a worktable extending around said drive device, said table being located substantially at the level of said point of treatment, and being adapted to support the workpiece during treatment thereof;

a correction device comprising a detecting device for detecting the presence of the workpiece and recentering means controlled by said detection device for displacing the workpiece substantially transversely with respect to the line of treatment and in an appropriate direction, as a function of the position of the workpiece, so that said workpiece is treated by the treatment machine along a line extending substantially parallel to the edge of the workpiece, said recentering means comprising two distinct means including:

at least one active guide, placed in the vicinity of the drive device of the treatment machine, upstream thereof in the direction of displacement of the workpiece during treatment, said active guide being rotated to move the workpiece thereby ensuring the displacement of that part of the workpiece located near the point of treatment, substantially transversely with respect to the line of treatment;

and a movable support, displaced from the active guide, presenting a movable flat surface lying in the same plane as the worktable, controlled by drive means for displacing said movable flat surface, said movable support being moved for ensuring the displacement of the upstream part of the workpiece,

and the active guide and the drive means of the movable support being selectively controlled, together or independently of each other, by the instructions given by the detection device.

4,682,554

METHOD AND APPARATUS FOR PERFORMING SEWING OPERATIONS UTILIZING SEWING MACHINE HAVING MEANS TO ADJUST TERMINAL STITCH PITCH AND SEW CONSECUTIVE PATTERNS

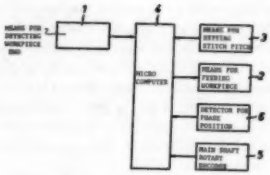
Sumio Goto; Jiro Ishibashi, and Masakazu Nemoto, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

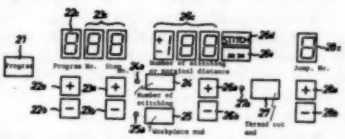
Filed Jun. 2, 1986, Ser. No. 869,678

Claims priority, application Japan, May 31, 1985, 60-119592

Int. Cl.[4] D05B *19/00, 27/22*

U.S. Cl. 112—262.1 **2 Claims**





2. A method for performing sewing operations on a workpiece using a sewing machine capable of adjusting stitch pitch to terminate the last stitching at a predetermined margin distance by calculating a number of stitches with original pitch and the adjusted pitch which is shorter than the original pitch when a workpiece end sensor detects the workpiece end, said method comprising the steps of:

storing stitch data corresponding to a plurality of different stitch patterns:

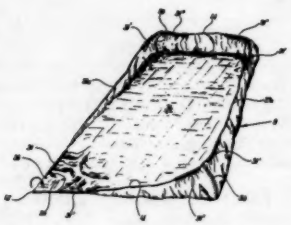
detecting the end of a stitching cycle;
selecting the stitch data corresponding to a subsequent stitch pattern from the stored stitch data when the end of a stitching cycle is detected;
calculating the stitch pitch by referring to said selected stitch data corresponding to a subsequent stitch pattern; and
adjusting stitch pitch.

4,682,555

PROCESS FOR THE MANUFACTURE OF FITTED ELASTIC BEDSHEETS OR SIMILAR SEAT COVERS

Joe Bierbaum, Borken; Siegfried Henze, Hohenroth; Karl Müssig, Bad Königshofen, and Hans Ziegler, Grossbardorf, all of Fed. Rep. of Germany, assignors to Texpa Arbter Machinenbau GmbH, Saal, Fed. Rep. of Germany

Filed Nov. 28, 1986, Ser. No. 935,840
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542445
Int. Cl.[4] D05B *1/00, 97/00*
U.S. Cl. 112—262.1 **6 Claims**



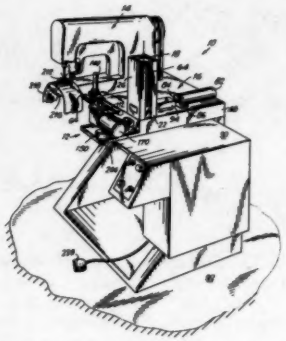
1. Process for the manufacture of fitted elastic bedsheets or similar seat covers, in which rectangular pieces of cloth are cut in segments from a strip of cloth, of which the corners are separated by approximately rectangular punches, and then in turn two adjacent cut edges are connected by a seam, and in which, furthermore, stretched elastic bands or the like are sewn in stretched-out state in or on the corresponding piped edges of the pieces of cloth, which in slackened state cause a drawing together of the cloth with formation of folds or wrinkles, characterized by:
(a) application of markings on the strip of cloth for determination of the attachment areas for the stretched elastic bands, the transverse cutting lines on the strip of cloth and the seam at each corner to be cut from a piece of cloth;
(b) sewing of the stretched elastic bands on or in the edges of the strip of cloth, while this is being held in a flat state;
(c) cutting of the individual pieces of cloth from the strip of cloth;
(d) sewing of the stretched elastic bands on or in the two edges of the pieces of cloth which correspond to the edges of the cut while the pieces of cloth are held flat;
(e) diagonal folding at each corner of a piece of cloth, so that the folded cloth segments lie flat one atop the other and the two adjacent edges of the cloth are flush at each corner;
(f) sewing together of the folded segments of cloth at each corner of a piece of cloth along the markings for the seam; and
(g) separation of the folded segments of cloth from the cloth corners to the side along each seam.

4,682,556

SMALL PART FEEDING AND INSERTING SYSTEM

Charles Block, North Bellmore, N.Y., assignor to Joseph Galkin Corporation, Hicksville, N.Y.

Filed Sep. 23, 1986, Ser. No. 910,592
Int. Cl.[4] D05B *21/00, 97/00*
U.S. Cl. 112—265.1 **1 Claim**



1. A method of joining a first object to a second object, the steps comprising, in combination:
positioning a first object within said joining zone,
causing a second object to be moved to a pickup zone,
moving transfer clamp means to said pickup zone,
causing said transfer clamp means to accept and hold said second object,
causing said transfer clamp means to transfer said second object from said pickup zone to an insertion zone,
causing said transfer clamp means to insert said second object into a joining zone,
clamping a left side of said second object against said first object positioned within said joining zone,
causing said transfer clamp means to release said second object and to move from said joining zone, and
joining said first and second objects.

4,682,557

SAILING WING

Thomas A. Magruder, 5932 Jordan Ave., El Cerrito, Calif. 94530, and Robert L. Crowell, Rte. 6, P.O. Box 473-B, Boone, N.C. 28607

PCT No. PCT/US85/02407, § 371 Date Dec. 5, 1985, § 102(e) Date Dec. 5, 1985
Continuation-in-part of Ser. No. 661,782, Oct. 17, 1984, abandoned. This PCT application Dec. 5, 1985, Ser. No. 817,846
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—39 **12 Claims**

1. A sailing apparatus comprising:
a hull adapted to support a sailor,
a wing having an axis of symmetry generally aligned with a

direction of wing flight with the wing movable with respect to the axis in roll, pitch and yaw directions,

a mast,

a lower joint connecting the mast to the hull for pivotal movement of the mast with respect to the hull in the pitch and roll directions, and

an upper joint connecting the wing to the mast for pivotal movement of the wing with respect to the mast in the roll direction but constrained against relative movement in the pitch direction with respect to the mast whereby the wing can be rolled between port and starboard tack positions through an intermediate life position whereby the hull can be lifted from the water,

one of the joints providing relative movement in the yaw direction.

4,682,558

UNDERWATER SCOURING APPARATUS

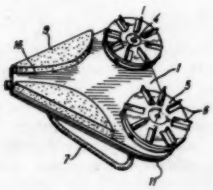
Gerrit Broersz, Schoonhoven, Netherlands, assignor to John Meade, United Kingdom

Filed Oct. 4, 1985, Ser. No. 784,172

Claims priority, application United Kingdom, Oct. 6, 1984, 8425322

Int. Cl.[4] B63B *59/06*

U.S. Cl. 114—222 **9 Claims**



1. Underwater scouring apparatus comprising a flexible sheet, mounting means for supporting said flexible sheet, and a plurality of rotatably drivable scouring tools each mounted on said sheet for movement with said sheet, each tool moving independently with respect to one another, said sheet having sufficient flexibility to allow said sheet to conform to a surface of a workpiece and said mounting means being configured to allow said sheet to conform to said surfface of said workpiece and to allow said tools to independently pass over an irregularity in said surface of said workpiece in response to the application of pressure to said apparatus.

4,682,559

GAS DRIVEN ANCHOR AND LAUNCHING SYSTEM THEREFOR

Emanuel Schnitzer, and Leonard E. Williams, Jr., both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jan. 21, 1986, Ser. No. 820,650

Int. Cl.[4] B63B *21/26*

U.S. Cl. 114—295 **11 Claims**

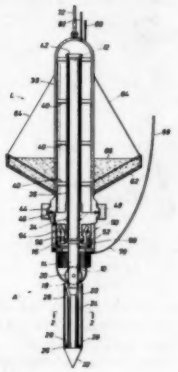
1. An anchor comprising

a pressure storage section having a pressure vessel, an inlet for introducing gas under pressure therein, and a central tube open at its upper end within said pressure vessel and open at its lower end to the exterior of said pressure vessel,

a groove around the interior of said central tube near its open lower end,

a seal positioned within said groove in said central tube,

a projectile section having a rod with a cone on its lower end, the upper portion of said rod positioned within said central tube and having a diameter to be in sealing engagement with said seal as said rod is moved axially through said central tube, and



a remotely controlled collet connector releasably securing said projectile section to said pressure storage section.

4,682,560

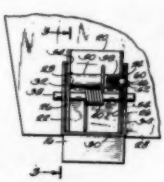
HIGH FORCE RELEASE AND RESET MECHANISM FOR SUPPORTING A STRUCTURE FROM A BOAT HULL

M. Jeremy Lieb, Waukegan, and Raymond D. Collis, Round Lake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 8, 1985, Ser. No. 752,647

Int. Cl.[4] B63B *49/00*

U.S. Cl. 114—343 **12 Claims**

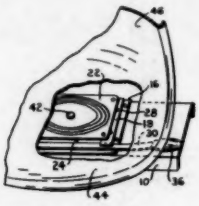


8. Apparatus for pivotally mounting a structure on a boat hull, said apparatus comprising a first hinge member adapted to be fixed to the boat hull and including a surface, a second hinge member adapted to support the structure and including a surface adjacent said surface of said first member, means for pivotally connecting said second hinge member to said first hinge member about a generally horizontal axis for movement between a first position and a second position, and detent means for releaseably holding said second hinge member in one of said positions and including an aperture in said surface of one of said first and second hinge members, a ball carried by the other of said first and second hinge members for horizontal movement relative to said first and second hinged members, and spring means extending in generally parallel relation to said horizontal axis for resiliently biasing said ball toward receipt in said aperture in said one of said first and second hinge members.

4,682,561
QUICK ATTACH AND RELEASE BASE

Danny R. Jentry, 12373 Third St., SE., Fort Myers, Fla. 33905

Filed Jun. 17, 1985, Ser. No. 745,062
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—363 1 Claim

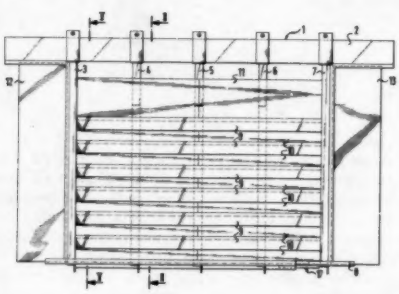


1. A seat for a boat of the fishing and canoe classes having spaced side walls, a thwart board connecting the side walls of the boat, a quick attach and release base comprising a thin base member adapted to be secured to the thwart board, spaced parallel guides secured to the base member and providing an open ended slot, an upper seat support member adapted to slidably project into the open ended slot, a pivoted lock and release arm adapted to overlie the open end of the slot to releasably clamp the seat support member in the slot, a handle to manipulate the lock and release arm, a non-rotatable turntable support member clampingly engaged to the seat support member, a rotatable turntable engaging the non-rotatable support member, a pivot between the non-rotatable support member and the rotatable turntable members, and a seat secured to the rotatable turntable member.

4,682,562
HOLDING DEVICE FOR METAL SECTIONS WHICH ARE TO BE COATED IN TWO COLORS

Uwe Hell, Trappenkamp, Fed. Rep. of Germany, assignor to Hell GmbH & Co., Trappenkamp, Fed. Rep. of Germany

PCT No. PCT/DE85/00185, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05573, PCT Pub. Date Dec. 19, 1985
PCT Filed May 30, 1985, Ser. No. 845,138
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420453
Int. Cl.[4] B05C *13/00, 13/02*
U.S. Cl. 118—500 15 Claims

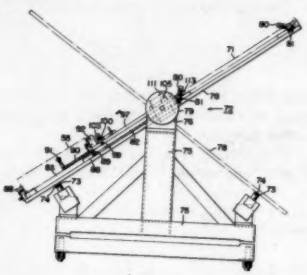


1. A holding and masking device for holding and masking items which are to be coated with two colors, said device comprising a frame having a top cross member, a bottom cross member spaced from said top cross member, a plurality of spaced bearers extending between said cross members and supported thereby, a plurality of support arms extending outwardly and loosely supported by said bearers, outer ends of said support arms, at least a pair of spaced masks supported by said outer ends of said support arms for receiving and holding at least one item, said masks and said item forming a continuous wall, whereby said masks isolate both sides of said item from each other for receiving different color treatments.

4,682,563
JIG FOR SUPPORTING ARRAY OF ARTICLES TO BE SOLDERED AND DEVICE FOR TRANSFERRING ARTICLES TO JIG

Tsugunori Masuda, Hidaka, and Shoji Muto, Sayama, both of Japan, assignors to Kabushiki Kaisha Tamura Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 489,068, Apr. 27, 1983, abandoned. This application Oct. 11, 1985, Ser. No. 786,650
Int. Cl.[4] B05C *13/02*
U.S. Cl. 118—503 5 Claims



1. A jig for arraying and supporting a multiplicity of articles to be soldered, characterized by comprising: a frame having frame members and adapted to be secured to a conveyor holder of a soldering line; pairs of rod shaped lower supporting wires extended between said frame members and adapted to support the lower side of respective articles; pairs of rod shaped upper supporting wires arranged above said lower supporting wires in parallel with the latter along both side surfaces of respective articles, one end of each of said upper supporting wires being passed loosely through a hole formed on said frame member; a gate member secured on the other end of each of said upper supporting wires and movable up and down with respect to said frame member; and article receiving ports formed in said frame member opposite to said gate member.

4,682,564
MAGNETOPLASMADYNAMIC PROCESSOR, APPLICATIONS THEREOF AND METHODS

Gordon L. Cann, 17751-F Sky Park East, Irvine, Calif. 92714

Continuation-in-part of Ser. No. 210,241, Nov. 25, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 512,728
Int. Cl.[4] B05B *5/02*
U.S. Cl. 118—620 89 Claims

1. An apparatus for depositing materials in layers by using a plasma beam electromagnetically accelerated in a vacuum comprising:

(a) a vacuum chamber and associated vacuum pumping apparatus;

(b) a magnetoplasmadynamic plasma generator, the plasma generator further comprising cathode means anode means a cathode magnet located in substantially surrounding relation to said cathode means; a trimmer magnet located in substantially surrounding relation to said anode means; a focusing magnet, at least part of which is located beyond the anode means with respect to the cathode means;

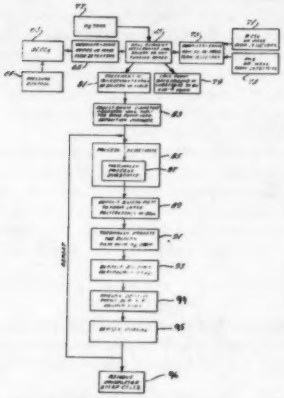
(c) a shielded plasma generator support structure, the support structure supporting the plasma generator within the vacuum chamber;

(d) a means to supply the plasma generator with electric power, the electric power being primarily direct current and the power enabling the plasma generator to create a plasma;

(e) a target surface, the target surface being located beyond the focusing magnet with respect to the cathode and anode; and

(f) means for injecting one or more of a plurality of materials at a location within said vacuum chamber so as to facilitate the creation of a plasma stream;

(g) said plasma stream impinging upon said target surface.



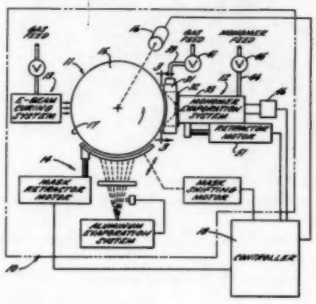
4,682,565
VAPOR NOZZLE WITH GAS BARRIER BARS

Philip H. Carrico, Greenfield Center, N.Y., assignor to SFE Technologies, San Fernando, Calif.

Continuation of Ser. No. 672,529, Nov. 19, 1984, abandoned. This application Jan. 16, 1986, Ser. No. 820,572

Int. Cl.⁴ G23C *14/00*

U.S. Cl. 118—719 **9 Claims**



1. A nozzle structure for depositing vaporized material on a relatively moving surface comprising, in combination, a frame fixed with respect to said surface, a plurality of bars fixed on said frame in parallel relation so as to closely overlie said surface, said bars having internal passages and elongated delivery openings from said passages adjacent said surface, a nozzle block having nozzle walls closely fitted between said bars and defining elongated openings facing said surface, means for delivering vaporized material to said nozzle block for depositing material on said surface from said nozzle block openings, and means for delivering inert gas to said internal passages so that inert gas barrier regions are created on the sides of the material being deposited.

6. Apparatus for continuously producing under vacuum a monolithic multi-layer capacitor on a substrate surface comprising means for forming a layer of electrode material on a surface within a predefined electrode forming zone, means for forming a coating of dielectric material on a surface within a predefined dielectric forming zone, said means for forming a coating of dielectric material including a first nozzle closely overlying the substrate surface at said dielectric forming zone, and a pair of second nozzles adjacent either side of said first nozzle for creating an inert gas wall on either side of the dielectric forming zone, and means for repeatedly passing the substrate surface carrying said layers and coatings through the two zones in sequence so that two different portions of the surface are simultaneously within their respective zones so as to produce alternate layers and coatings of electrode and dielectric on the substrate surface.

4,682,566
EVACUATED EQUIPMENT

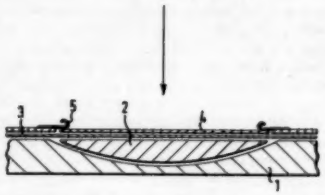
Derek Aitken, East Molesey, England, assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 136,677, Apr. 2, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,659

Claims priority, application United Kingdom, Apr. 6, 1979, 7912217

Int. Cl.⁴ F28F *23/00*

U.S. Cl. 118—724 **15 Claims**



1. In combination, in evacuable equipment for processing components under vacuum, the improvement, in securing heat transfer between one part of the equipment and another part or between a part of the equipment and a component being processed therein, comprising a body of thermally conductive fluid in thermal contact with said first mentioned part of the equipment and confined by a flexible diaphragm disposed for separable, direct, surface-conforming thermal contact with said other part or component.

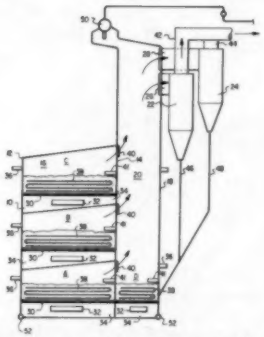
4,682,567
FLUIDIZED BED STEAM GENERATOR AND METHOD OF GENERATING STEAM INCLUDING A SEPARATE RECYCLE BED

Juan A. Garcia-Mallol, Morristown, and Michael G. Alliston, Denville, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed May 19, 1986, Ser. No. 864,349

Int. Cl.⁴ F22B *1/02*

U.S. Cl. 122—4 D **5 Claims**



1. A steam generator comprising a furnace section, means in said furnace section for receiving a plurality of vertically spaced beds of particulate fuel material, means for introducing air into said beds to fluidize said beds and promote the combustion of said fuel material, means for introducing additional fuel to each of said beds, the effluent gases from each of said beds

rising upwardly into the areas above said beds, one boundary wall of said furnace section having openings therein for permitting the discharge of effluent gases from said areas above said beds, a heat recovery enclosure disposed adjacent said furnace section, said boundary wall serving as a common wall between said furnace section and said enclosure so that said enclosure receives said discharged effluent gases, means for receiving a bed of particulate fuel material in said enclosure extending to the side of the lowest of said vertically spaced beds, means for introducing air into said bed in said enclosure to fluidize and promote the combustion of said fuel material in said latter enclosure, means for adding additional fuel material to said fluidized bed in said enclosure, the effluent gases from said enclosure combining with the effluent gases from said furnace section, the height of said enclosure being greater than that of said furnace section so that the effluent gases in said enclosure pass upwardly through said enclosure for a distance greater than the height of said furnace section, means disposed adjacent said enclosure for receiving said combined effluent gases from said enclosure and separating the entrained solid particles from said latter gases, and means for injecting the separated solid particles into the fluidized bed in said enclosure.

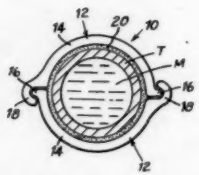
4. A method of operating a steam generator comprising the steps of establishing at least one bed of particulate material including fuel in a furnace, introducing air into said bed at a predetermined velocity to fluidize and promote the combustion of said material, adding additional particulate material including fuel to said bed, discharging effluent gases from said fluidized bed through a boundary wall of said furnace, said boundary wall serving as a common wall between said furnace and a heat recovery enclosure for receiving said discharged effluent gases, establishing a bed of particulate material including fuel in said enclosure, introducing air into said bed in said enclosure to fluidize and promote the combustion said fuel material in said enclosure, adding additional fuel material to said fluidized bed in said enclosure, combining in said enclosure the effluent gases from said bed in said enclosure and the effluent gases from said furnace, passing said combined gases through said enclosure for a distance which exceeds the height of said furnace section, separating the entrained solid particles from said combined gases, injecting the separated solid particles into the fluidized bed in said enclosure, and controlling the amount of material in said fluidized bed in said enclosure relative to said fluidizing velocity so that the combined gases in said enclosure are saturated with said material.

4,682,568

REFRACTORY SHIELD FOR SUPERHEATER TUBES

Kenneth E. Green, Auburn; Donald K. Johnson, and Roger W. Woodruff, both of Holden, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Jun. 5, 1986, Ser. No. 871,004
Int. Cl.[4] F22B *15/00, 25/00, 37/10*
U.S. Cl. 122—235 C **15 Claims**



1. A refractory shield for protecting superheater tubes against attack by the products of combustion comprising:

a pair of elongated molded and fired refractory half shields of predetermined identical interchangeable interlocking size and shape adapted when one of the half shields is rotated 180° and extended longitudinally relative to the other half shields to be slid axially together and interlocked together solely thereby without additional fastening means, surround and shield the superheater tube, each half shield having:

an elongated refractory sidewall portion of predetermined axial length and thickness between opposite ends thereof extending circumferentially between and to diametrically opposite retractory tongue and grooved side wall portions of predetermined axially engageable interlocking shape;

an elongated tongue of predetermined shape, width and radial length projecting radially outwardly from the tongue sidewall portion; and

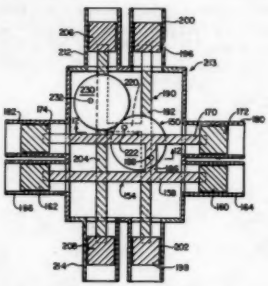
an elongated internal groove projecting radially outward in the grooved side wall portion and of predetermined interlocking shape, sufficient width and radial depth to accept an elongated tongue of the other one of the pair of half shields assembled and locked together against relative rotation solely by axially inserting the tongues into the grooves.

4,682,569

OSCILLATORY MOTION APPARATUS

Alfred H. Stiller, and James E. Smith, both of Morgantown, W. Va., assignors to West Virginia University, Morgantown, W. Va.

Division of Ser. No. 706,153, Feb. 27, 1985, Pat. No. 4,641,611, which is a continuation-in-part of Ser. No. 628,748, Jul. 6, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,324
Int. Cl.[4] F02B *75/22*
U.S. Cl. 123—55 A **7 Claims**



1. Oscillatory motion apparatus comprising

first rod means mounted for oscillating movement in a first direction,

second rod means mounted for oscillating movement in a second direction,

first trammel gear means pivotally secured to said first rod means by first pivot means,

said first trammel gear means pivotally secured to said second rod means by second pivot means, whereby coordinated oscillating movement of said first rod means and said second rod means will effect responsive rotational and translational movement of said trammel gear means,

said first pivot means being relatively spaced from said second pivot means,

said first rod means having a first connecting rod connected to a second connecting rod by a first crossover member,

said second rod means having a third connecting rod connected to a fourth connecting rod by a second crossover member,

eccentrically mounted output gear means having an axially fixed mounting, operatively associated with said trammel gear means for effecting rotational movement responsive to rotation and translation of said trammel gear means, and

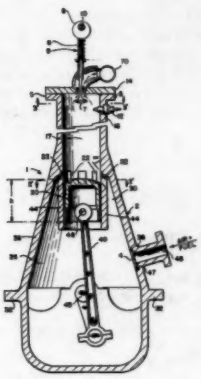
said output gear means having an output gear and a rotatable output shaft positioned coaxially with the eccentric mounting of said output gear, whereby the rotational component of the movement of said trammel gear means will effect rotation of said output shaft.

4,682,570

INTERNAL COMBUSTION ENGINE (JV-1)

John Velencei, Daly Rd., Far Hills, N.J. 07931

Filed Nov. 26, 1984, Ser. No. 674,945
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 PP 9 Claims



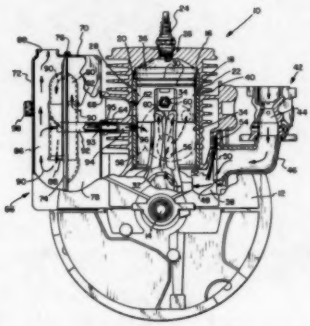
1. An internal combustion engine cylinder assembly comprising an elongated cylinder having substantially vertically disposed interior walls defining an elongated firing chamber therein; piston means housed within said firing chamber and adapted for vertical reciprocation within said firing chamber; gas inlet channels in the lower portion of said firing chamber; a crankcase housing having a gas compression chamber disposed therein; a reed valve means pivotally secured to the inner walls of said gas compression chamber and adapted for passing fuel/air mixtures into the gas compression chamber upon the depressuring thereof; a cylinder closure means positioned at the upper end of said cylinder defining the upper end of said firing chamber and being provided with exhaust gas valve means, adapted for cyclic opening and closing to alternatively permit the removal of exhaust gases from said firing chamber and the pressuring of said fresh fuel/air mixtures in said firing chamber; fuel ignition means for igniting a compressed fuel/air mixture in said firing chamber; at least a portion of said elongated cylinder inner walls extending downwardly into said gas compression chamber and adapted to house at least a portion of said piston means therein during the full downstroke of said piston means; the upper portion of said crankcase housing having inwardly sloping walls to define a substantially uniformly converging gas space in the upper portion of said gas compression chamber annularly about said downwardly extending cylinder portion, said gas inlet channels providing direct gaseous communication between said firing chamber and said converging gas space, and said piston means being arranged to cyclically open and close said gas inlet channels to control said gaseous communication; said piston means cooperating with said exhaust valve means and said fuel ignition means for controlling the pressurization and charging of fresh fuel/air mixtures into said firing chamber from said converging gas space and the compression of said fuel/air mixtures and the ignition thereof in said firing chamber to generate power and to remove from said firing chamber the thus generated exhaust gases.

4,682,571

EXHAUST GAS RECIRCULATION SYSTEM FOR CRANKCASE SCAVENGED TWO CYCLE ENGINE

Vernon R. Kaufman, Cedarburg, and Miles S. Geringer, Milwaukee, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 17, 1985, Ser. No. 810,063
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 A 18 Claims



6. A two cycle crankcase scavenged engine comprising:
a cylinder having a piston reciprocably disposed therein, said piston and cylinder forming a combustion chamber,
a crankcase,
an exhaust port opening into said combustion chamber,
exhaust system means connected to said exhaust port for conducting exhaust gas away from said engine and cooling the exhaust gas,
means for forming an air-fuel mixture and introducing the mixture into said crankcase through an intake opening,
a transfer passage connecting said crankcase to said combustion chamber,
an exhaust recirculation port opening into said crankcase, and
exhaust gas recirculation means connected to said exhaust system means for recirculating exhaust gas into said crankcase through said recirculation port.

4,682,572

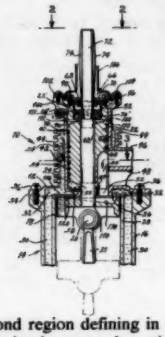
HIGH EFFICIENCY PERFORMANCE KINETIC OCCLUDE SYSTEM WITH ROTARY VALVE

Samuel Hepko, Rte. 1, Box 2170-1, Branson, Mo. 65616

Division of Ser. No. 649,699, Sep. 12, 1984, Pat. No. 4,592,312.
This application Feb. 10, 1986, Ser. No. 828,755
Int. Cl.[4] F01L *7/10*; F02F *3/26*
U.S. Cl. 123—80 BB 5 Claims

1. In an internal combustion engine including at least one cylinder, a piston reciprocal in the cylinder, valve apparatus, and a shaft carried centrally by and extending above the face of the piston for operation of the valve apparatus, the improvement characterized by the piston defining a face, the piston including first and second regions, the first region including a recess and the second region being flat, the recess having a central portion recessed relatively deeply into the face of the piston and surrounding the shaft, the recess being C-shaped in plan and substantially concentric about the center of the piston face and concentric also with respect to the shaft, the first region defining the major extent of the surface area of the

piston face and tapering uniformly upwardly in opposite directions on opposite sides of the shaft to opposite side edges of the



second region, the second region defining in plan view a V-shaped configuration having its apex substantially at the shaft.

4,682,573

VALVE GEAR FOR USE IN A FOUR CYCLE ENGINE

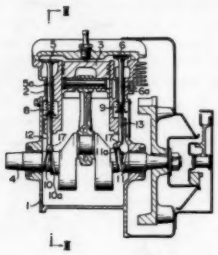
Tetsuzo Fujikawa, Kobe; Makizo Hirata, and Shinichi Tamba, both of Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 578,631, Feb. 9, 1984, abandoned. This application May 9, 1986, Ser. No. 862,170

Claims priority, application Japan, Feb. 15, 1983, 58-24442

Int. Cl.[4] F01L *1/32*

U.S. Cl. 123—90.2 **1 Claim**



1. A valve gear for use in a four-cycle engine having a crank shaft, an air-intake valve having a stem, and an exhaust valve having a stem comprising:

(a) guide means formed by closed-curve grooves making two rounds of the outer surface of said crank shaft with one intersection on the way for controlling the movement of said air-intake valve and said exhaust valve of said engine upon rotation

(b) slider means connected to operate each said valve stem under guidance of said guide means, said slider means including:

a vertically elongated rod portion supported for rotary rocking and reciprocating lifting and dropping movement relative to and along the axis of a corresponding valve stem and having an upper end surface engaging a lower end surface of the corresponding valve stem;

rocking means for reciprocating said rod portion and positively rotating carried thereby said rod portion in two directions opposite to each other upon rotation of the crank shaft, the engagement between the upper end surface of each rod portion and the lower end surface of each valve stem producing rotation of the valve stem in one direction during a lifting phase and in the opposite direction during a dropping phase, the amplitude of rotation produced during the lifting phase being greater than the amplitude of rotation produced during the dropping phase, whereby the valve stem and valve carried thereby are rotated incrementally in the one direction upon rotation of the crank shaft;

said rocking means comprising:

a horizontal arm portion extending from one end of said elongated rod portion and rockable about a vertical axis of said slider means; and

a ball rotatably supported on the tip of said arm portion and guided by said guide means providing a low friction connection with said guide means as said crank shaft rotates to produce rocking movement of said horizontal arm portion and reciprocating and rotary rocking movement of said vertically elongated rod portion to operate each of said valves.

4,682,574

ELECTROMAGNETICALLY-ACTUATED POSITIONING SYSTEM

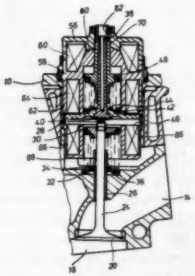
Peter Kreuter, Josef-Ponten Str. 38, Aachen, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 850,937

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513107

Int. Cl.[4] F01L *9/04;* **H01F** *7/08*

U.S. Cl. 123—90.11 **8 Claims**



1. An improved guide and centering system for an electromagnetically-actuated positioning mechanism of spring-loaded valve-type reciprocating actuators in displacement machines, comprising in operative combination:

(a) means for reciprocatingly actuating a valve member, said reciprocating actuator means being movable between two discrete, mutually-opposite operating positions;

(b) said reciprocating actuator means comprising a rod member having an electromagnetically attractable anchor plate member secured adjacent one end thereof, said actuator means being disposed to permit said valve member to move from a first, closed operating position to a second, open operating position;

(c) said reciprocating actuator means being biased toward said second open position by at least one spring member having opposed ends;

(d) one end of said spring being receivingly engaged by a support member acting as one seat for said spring member;

(e) means for adjusting the position of said spring support member, said adjusting means comprising a tubular sleeve member having said support member mounted medially thereof; and

(f) said sleeve member being adapted to reciprocatingly receive said actuator rod member so that as said spring position is adjusted, said rod guides said sleeve, and as said

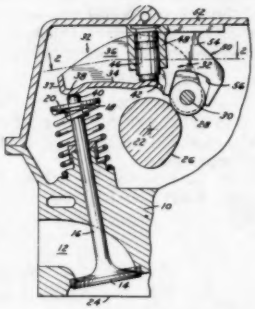
actuator means actuates said valve member said sleeve guides said rod.

4,682,575

LOW FRICTION HIGH SPEED ROCKER ARM

Aladar O. Simko, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1986, Ser. No. 846,386
Int. Cl.[4] F01L *1/18*
U.S. Cl. 123—90.44 **7 Claims**



1. A valve train for an internal combustion engine comprising, a camshaft mounted close above the cylinder head face of the engine, a one-piece essentially U-shaped rocker arm mounted above the camshaft for an arcuate movement and defined by a bottom wall integral with a pair of laterally spaced upstanding side walls, the bottom wall having a cylindrical fulcrum surface projecting upwardly therefrom, a lash adjuster fixedly supported above the rocker arm against lateral movement and having a lower surface engaging the cylindrical fulcrum surface with a contact establishing a pure rolling motion without friction of the rocker arm upon the lash adjuster lower surface, a reciprocatingly mounted valve stem engaging one end of the rocker arm for reciprocation of the valve, the other end of the rocker arm rotatably supporting a dual function roller engagable with a cam lobe on the camshaft for arcuate pivoting of the rocker arm about its fulcrum upon rotation of the camshaft, support means supporting the roller for both an arcuate movement of its axis of rotation along a predetermined path providing a pure rolling motion of the rocker arm about its fulcrum upon the lash adjuster surface and confining the roller and arm in a manner preventing longitudinal sliding movement of the rocker arm fulcrum surface relative to the lash adjuster surface.

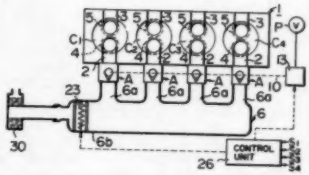
4,682,576

INTAKE SYSTEM FOR DIESEL CYCLE ENGINES

Saburo Nakamura, Higashihiroshima; Shigeru Sakurai; Takumi Nishida, both of Hiroshima, and Masanori Sahara, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 6, 1985, Ser. No. 741,884
Claims priority, application Japan, Jun. 10, 1984, 59-85942[U]
Int. Cl.[4] F02M *35/10, 31/02*
U.S. Cl. 123—179 A **24 Claims**

1. An intake system for diesel cycle engines comprising intake passage means leading through intake port means to combustion chamber means, timing suction pressure responsive valve means provided in said intake passage means for closing said intake passage means in a beginning period of intake stroke wherein the intake port means is opened to said combustion chamber means and opening the intake passage means in the remainder period of the intake stroke, characterized by the fact that said valve means includes a valve member which is movable between a closed position wherein it closes the intake passage means and an open position wherein it opens the intake passage means, biasing means for biasing the valve member toward said closed position, said valve member having a first surface which is subjected in said closed position to a pressure in said intake passage means upstream the valve means and a second surface which is subjected in said closed position to a pressure in the combustion chamber means so that a difference between the pressures on the first and second surfaces of the valve member assists the biasing means biasing the valve member to the closed position, valve actuator means comprising suction pressure chamber means defined at least partly by pressure responsive movable member, means connecting said movable member with said valve member so that a movement of the movable member is transmitted to the valve member and communicating passage means for communicating said suction pressure chamber means with said intake passage means downstream the valve means so that a suction



pressure produced in said intake passage means downstream the valve means in the intake stroke is introduced into the suction pressure chamber means to cause a movement of the movable member for moving the valve member under said suction pressure from the closed position to the open position after said beginning period of the intake stroke and maintaining the valve member at the open position at least until bottom dead center of the intake stroke.

20. An intake system for diesel cycle engines which includes intake passage means leading to combustion chamber means, timing valve means provided in said intake passage means for closing said intake passage means in an initial period of intake stroke and opening said intake passage means in an intermediate period of the intake stroke until at least bottom dead center, heating means provided in said intake passage means upstream the timing valve means, and operating means for operating the heating means and making the timing valve means operative under a low engine temperature.

4,682,577

METHOD AND APPARATUS FOR REDUCING NOX IN INTERNAL COMBUSTION ENGINE

Kenji Kato, Sizuoka; Tokuta Inoue, Mishima; Kiyoshi Nakanishi, and Soichi Matsushita, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 29, 1985, Ser. No. 696,172
Claims priority, application Japan, Feb. 28, 1984, 59-37423
Int. Cl.[4] F02D *41/10, 43/04*
U.S. Cl. 123—492 **11 Claims**

1. A method of reducing the amount of nitrogen oxides in an internal combustion engine, comprising the steps of:

(a) calculating a basic fuel injection duration;

(b) calculating an amount of variation in an intake pipe pressure;

(c) judging whether or not said amount of variation in the intake pipe pressure is larger than a predetermined value;

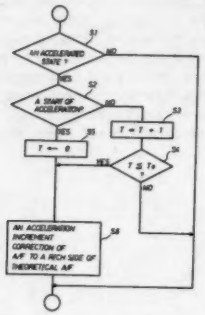
(d) measuring an elapsed time from said amount of variation exceeding said predetermined value;

(e) judging whether or not said elapsed time is longer than a predetermined time;

(f) controlling the air/fuel ratio to be greater than a stoichiometric air/fuel ratio in response to said basic fuel injection duration both: (1) when said amount of variation in the

intake pipe pressure is below said predetermined value, and (2) when said amount of variation in the intake pipe pressure is larger than said predetermined value and said elapsed time is longer than said predetermined time;

(g) only when said amount of variation in the intake pipe pressure is larger than said predetermined value and said elapsed time is below said predetermined time, adding said basic fuel injection duration to an incremental injection duration as a final injection time; and


AN ACCELERATED STATE ?
A START OF ACCELERATION
T ← T + 1
T ← 0
T ≦ Tx ?
AN ACCELERATION INCREMENT CORRECTION OF A/F TO A RICH SIDE OF THEORETICAL A/F

(h) controlling the air/fuel ratio in accordance with said final injection time when said amount of variation in the intake pipe pressure is greater than said predetermined value and said elapsed time is shorter than said predetermined time, said incremental injection duration causing said final injection time to produce an air/fuel ratio which is smaller than said stoichiometric air/fuel ratio.

4,682,578

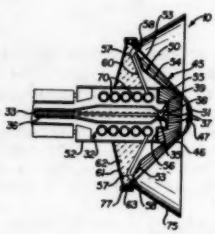
INFRARED RADIANT HEATER

Gerhard Schmidt, Edmonton, Canada, assignor to Flour City Architectural Metals, Division of E.G. Smith Construction Products, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 658,385, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 554,207, Nov. 22, 1983, abandoned. This application Oct. 17, 1986, Ser. No. 920,579

Int. Cl.[4] **F24C** *3/00*

U.S. Cl. 126—91 R **23 Claims**



1. An infrared radiant heating apparatus for use in heating articles rapidly and efficiently by infrared radiation absorption, said apparatus comprising a support frame, a heat absorbing and radiating heater mounted on said support frame, said heater including an inner heat cone and an outer heat cone spaced apart from each other and joined together along their outer peripheries to define a combustion chamber therebetween, said outer heat cone having an exposed convex conical surface and being formed of a heat absorbing and radiating material, said heater further including a fuel pipe extending to a nozzle which extends through said inner heat cone and opens into said combustion chamber, a shroud surrounding said fuel pipe, a cylindrical jacket surrounding and spaced apart from said shroud and joined at one end to said inner heat cone, a helical exhaust pipe disposed within said jacket and surrounding said shroud, said inner cone having a plurality of exhaust ports therethrough along its outer periphery, with each of said exhaust ports connected to said helical exhaust pipe by a tubular pipe, means for channeling combustion and exhaust gases from said combustion chamber along the inner surface of said outer cone and to said exhaust ports, and burner means including means for supplying fuel to said fuel pipe and means for supplying air through the space between said jacket and said shroud and to said nozzle, whereby hot gases pass through said tubular pipes and through said helical exhaust pipe and the incoming combustion air passes over said helical exhaust pipe and is preheated thereby from the transfer of heat.

4,682,579

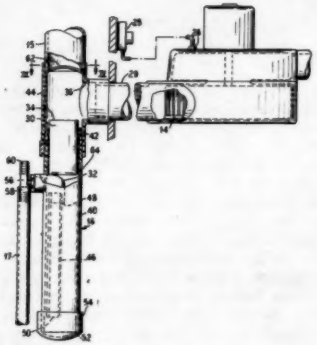
CONDENSATE OVERFLOW CONTROL FOR FURNACE

Davis L. Bigham, Franklin, Tenn., assignor to Heil-Quaker Corporation, LaVergne, Tenn.

Filed Feb. 21, 1986, Ser. No. 831,981

Int. Cl.[4] **F24H** *3/02;* **F04B** *10/00*

U.S. Cl. 126—110 R **17 Claims**



1. In a domestic forced air condensing furnace including a blower for forcing all of the combustion products and condensate to an outlet conduit, said outlet conduit connected to a condensate trap and a vent, and a pressure sensor to detect the negative pressure created by the blower and a decrease in the negative pressure caused by a vent blockage, the improvement comprising:

a float means positioned in said condensate trap arranged to block said outlet conduit when the condensate in said trap increases to an undesirable level and to remain clear of said outlet conduit when said condensate level is below said undesirable level;

whereby, said pressure sensor will detect a rise in the condensate level when it reaches said undesirable level due to blockage of said outlet conduit by said float means.

7. In a domestic forced air furnace having a burner including a heat exchanger for receiving the products of combustion from said burner which extracts sufficient heat from the combustion products to cause the formation of condensate, a blower, and conduit means for connecting the heat exchanger to the blower to pass all of the combustion products and condensate from the heat exchanger to the blower and the blower passing all the combustion products and condensate therethrough to an outlet conduit and then to a vent and condensate trap, respectively, said condensate trap having drainage means associated therewith, and a pressure sensor to detect the negative pressure created by the blower and a decrease in the negative pressure caused by a vent blockage, the improvement comprising:

a float means positioned in said condensate trap arranged to move between a normal operating position clear of said outlet conduit and a raised position in response to an undesirable rise in the level of condensate in said condensate trap, said raised position of said float means blocking said outlet conduit;

whereby the outlet to said vent will be blocked and said pressure sensor will sense the blockage caused by the rise in the condensate level.

4,682,580

EXHAUST SYSTEM FOR A COOKING APPARATUS

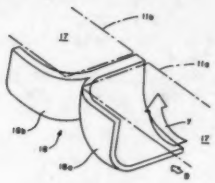
Shigeaki Fukumoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 10, 1986, Ser. No. 827,826

Claims priority, application Japan, Mar. 12, 1985, 60-35720[U]

Int. Cl.⁴ F23J *11/00*

U.S. Cl. 126—299 D **9 Claims**



1. A cooking apparatus comprising

a horizontal duct with inlets at both ends thereof, said duct being so connected as to admit exhaust gas thereinto through said inlets and to cause said admitted exhaust gas to travel inside said duct toward each other, said duct having a horizontal outlet and a vertical outlet, and

a structure disposed inside said duct and supported rotatably around a horizontal axis, said structure serving at a first angular position around said axis to deflect said exhaust gas approximately by 90 degrees toward said horizontal outlet, said structure serving at a second angular position around said axis to deflect said exhaust gas approximately by 90 degrees toward said vertical outlet.

4,682,581

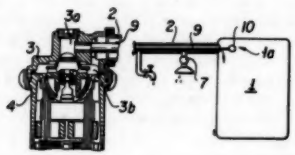
SECONDARY CIRCULATION SYSTEM

Karsten Laing, 3970 Honeycutt St., San Diego, Calif. 92109; Doerte Laing, and Birger Laing, both of Hofener Weg 35, 7148 Remseck 2-Aldingen, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 828,985

Int. Cl.⁴ F24H *1/00*

U.S. Cl. 126—362 **5 Claims**



1. Circulation system for secondary circulation in a domestic hot water system composed of a distribution pipe, a circulation pipe for secondary circulation, and a pump with a pumphousing having the two openings for inlet and outlet of water, which together form a loop, whereby both ends of the loop communicate with the heat source, e.g. a tank characterized in that

the circulation pipe (9), having an inner diameter of about ¼ inch, is situated within the distribution pipe (2),

the first end of the circulation pipe (9), communicates with the pump (3,4),

the second end of the circulation pipe (9) communicates with the hot region of the heat source (1) (e.g. the upper level of a tank),

between the first end of the circulation pipe (9) and one opening of the pumphousing a valve (22, 23) is arranged,

the other opening of the pump housing communicates with the interior of the heatsource (1) via a tube (28),

between said tube (28) and said other opening of the pump housing a valve (26, 27) is arranged,

one of the two valves (22, 23, 26, 27) being a checkvalve, preventing backflow through the pump housing caused by pressure difference between the second end of the circulation pipe (9) and the distribution pipe (2).

4,682,582

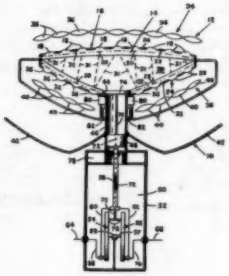
SOLAR ENERGY COLLECTOR AND SUN MOTOR UTILIZING SAME

Attila Zsida, Ridgewood, N.Y., assignor to Christiane Grams, Ridgewood, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,195

Int. Cl.⁴ F24J *2/08*

U.S. Cl. 126—440 **14 Claims**



1. A solar energy collector comprising a lens system having a convex outer light receiving face and having a series of condensing lens elements, each having a focal plane, said focal planes of said lens system collectively defining a focal surface, and metal element means located in said focal surface, said focal surface located within the material of said lens system and said metal element means being embedded within the material of said lens system.

4,682,583

INFLATABLE ARTIFICIAL SPHINCTER

John H. Burton, 13110 Greenwood Rd., Minnetonka, Minn. 55343, and Brad G. Staehle, 17220 Creek Ridge Pass, Minnetonka, Minn. 55345

Filed Apr. 13, 1984, Ser. No. 600,107

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—1 R **8 Claims**

1. An artificial sphincter, comprising:

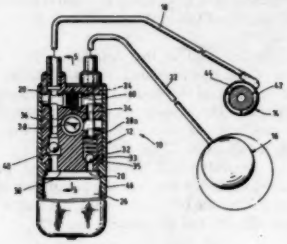
inflatable fluid operated occlusion means for occluding a body passage;

a fluid reservoir;

a flow passage adapted to provide restricted fluid communication between said occlusion means and said reservoir, said passage arranged such that fluid tends to drain from said reservoir into said occlusion means through said passage;

a pump means in fluid communication with said occlusion means for selectively transferring fluid from said occlu-

sion means to said reservoir to deflate said occlusion means so that the body passage may be opened; and



locking means, located along said flow passage, for selectively occluding the flow of fluid from said reservoir to said occlusion means through said flow passage.

4,682,584

DENTAL CARE INSTRUMENT

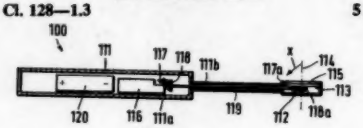
Wolfgang Pose, Eppendorfer Landstrasse 44, D-2000 Hamburg 20, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,129

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1984, 8431762; Nov. 6, 1984, 8432394; European Pat. Off., Feb. 28, 1985, 85102257.4; Fed. Rep. of Germany, Sep. 3, 1985, 8525069

Int. Cl.[4] A61B *17/52*

U.S. Cl. 128—1.3 **5 Claims**



1. A dental care instrument comprises a bar-like handle configured in the form of a housing, part of said housing having an elongate handle and another portion of said housing having a chamber, a magnet arranged in a position in said chamber such that when the part of the housing that contains said chamber and said magnet is inserted into an oral cavity and given a predetermined movement the magnet will produce a magnetic field to neutralize energy emissions from substances in said oral cavity, characterized in that a rotating disk is arranged on an axis at a right angle to the lengthwise dimension of said handle, said magnet comprises at least one bar magnet on said disk, and driving means by which the aforesaid disk may be rotated in a plane which can be continuously modified with respect to the horizontal.

4,682,585

OPTICAL SYSTEM FOR AN ENDOSCOPE

Siegfried Hiltebrandt, Knittlingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

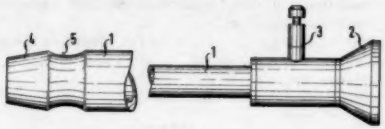
Filed Feb. 5, 1986, Ser. No. 826,187

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506464

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **11 Claims**

1. An optical system for an endoscope comprising a shaft receiving optical guide elements, said shaft being insertible through guide means into a bodily cavity for examination, said shaft at a distal end having an integral frusto conical portion converging towards the distal extremity, and said shaft having



at least one peripheral constriction at a proximal side of the conical portion.

4,682,586

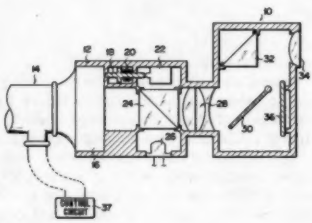
AUTOMATIC EXPOSURE CONTROL DEVICE FOR ENDOSCOPE

Kazumasa Matsuo, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 54,881, Jul. 5, 1979. This application Oct. 4, 1984, Ser. No. 657,476

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **2 Claims**



1. In combination, an endoscope having an image transmitting optical system and an eyepiece section at one end of the image transmitting optical system, a plurality of recesses located at the eyepiece section, the positions and numbers of said recesses representing in combination the size of a diameter of said image transmitting optical system which is indicative to said endoscope, and a camera for the endoscope,

said camera having an attachment section for attachment to the eyepiece section of said endoscope for photographing an image whose size is determined by the diameter of said image transmitting optical system,

signal generating means having a plurality of actuators provided at the attachment section of said camera and normally biased to extend toward the endoscope, said plurality of actuators each being independently reversed-biased if an end of the actuator does not coincide with a recess of the endoscope when the endoscope is attached to said camera to communicate the size of a field of view of said endoscope corresponding to the diameter of said image transmitting optical system to said camera and produce a correction signal corresponding to a combination of a bias state of said actuators,

light receiving means provided within said camera for producing a light receiving signal corresponding to an amount of light reflected from a predetermined area of a film surface, and

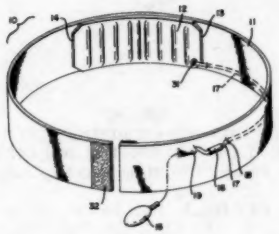
exposure means connected to said signal generating means and light receiving means for determining an exposure value in accordance with the light receiving signal and the correction signal.

4,682,587

COMPOUND FORCE SACRO-LUMBAR SUPPORT BELT

James D. Curlee, Mechanicsburg, Pa., assignor to Pneumedic Corp., Palmerton, Pa.

Filed May 7, 1985, Ser. No. 731,392
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.[4] A61F 5/01, 5/04
U.S. Cl. 128—78 1 Claim



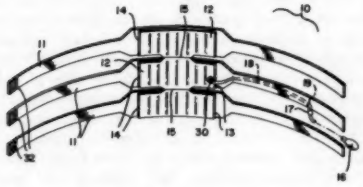
1. A compound force sacro-lumbar support belt comprising an inflatable envelope, said envelope being divided into a multitude of intercommunicating, parallel ribs disposed perpendicular to the longitudinal axis of said belt, means to introduce fluid to said envelope and to retain said fluid within said envelope, upon introduction of fluid said envelope shrinking along its length and said ribs contacting the wearer and providing lines of pressure in the sacro-lumbar region, said envelope being constructed of a material having relatively no stretchability compared to the amount of shrinkage, said shrinkage and said ribs being the only means of support to the sacro-lumbar region, means to secure said envelope to said wearer, said means to secure being two flexible straps.

4,682,588

COMPOUND FORCE THERAPEUTIC CORSET

James D. Curlee, Mechanicsburg, Pa., assignor to Pneumedic Corp., Palmerton, Pa.

Filed May 7, 1985, Ser. No. 731,394
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.[4] A61F 5/01, 5/04
U.S. Cl. 128—78 1 Claim



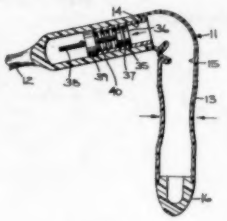
1. A compound force sacro-lumbar support corset comprising at least two inflatable envelopes, each of said envelopes being divided into a multitude of intercommunicating, parallel ribs disposed perpendicular to the longitudinal axis of said corset, means to introduce fluid to said envelopes and to retain said fluid within said envelopes, upon introduction of fluid, said envelopes shrinking along their lengths and said ribs contacting the wearer and providing lines of pressure in the sacro-lumbar region, said envelopes being constructed of a material having relatively no stretchability compared to the amount of shrinkage, said shrinkage and said ribs being the only means of support to the sacro-lumbar region, means to secure said envelopes to said wearer, said means to secure being flexible straps.

4,682,589

PENILE PROSTHESIS

Roy P. Finney, Bayport, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 459,776, Jan. 21, 1983, which is a division of Ser. No. 313,729, Oct. 22, 1981, Pat. No. 4,378,792, which is a division of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396, and Ser. No. 680,746, Dec. 12, 1984, Pat. No. 4,622,958. This application Dec. 18, 1985, Ser. No. 810,420
Int. Cl.[4] A61F 2/26
U.S. Cl. 128—79 2 Claims



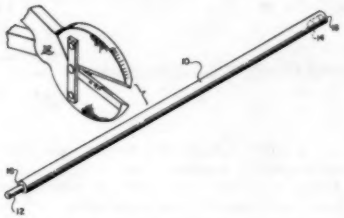
1. A valveless self-contained penile implant consisting essentially of an elongated, hollow, non-distensible cylinder having a flexible collapsible portion at one end for implanting into a corpus cavernosum of a pendulous penis and a relatively rigid other end for implanting in the root end of said corpus, pressurizing fluid substantially filling said hollow cylinder; a spring actuated, extendable piston closely fit in a longitudinal bore at the other end of said cylinder, said piston being extendable to transfer pressurizing fluid from the bore into said flexible, collapsible portion to thereby fill it and make it rigid; and, means for maintaining the spring actuated piston in a non-extended state until it is desired to tranfer the fluid into the flexible collapsible portion.

4,682,590

METHOD OF INSERTING INTRAMEDULLARY COUPLED PIN

Kody R. Kothmann, Rte. 9, Box 73M, Lubbock, Tex. 79423

Continuation-in-part of Ser. No. 595,812, Apr. 2, 1984. This application Nov. 5, 1985, Ser. No. 795,473
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YZ 4 Claims



1. The method of immobilizing a fractured tubular bone having a marrow cavity using:

two rods joined at a coupling which locks the rods into a pin which can only be unlocked by pulling the rods axially apart,

said pin having two ends, one end on each rod;

COMPRISING THE STEPS OF:

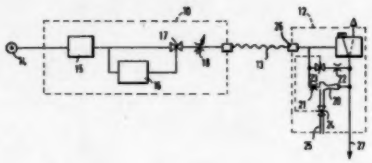
choosing a pin diameter which will fit snugly into the marrow cavity,
cutting the end from each rod so with each rod inserted into the marrow cavity with the cut end against the cancellous bone that the coupling of each rod is at the fracture,
inserting each rod into the fractured bone, and
joining the rods at the coupling to form the pin.

4,682,591

RESUSCITATOR/VENTILATOR

Norman S. Jones, Leighton Buzzard, England, assignor to Pneupac Limited, London, England

Filed Apr. 30, 1986, Ser. No. 857,936
Claims priority, application United Kingdom, May 2, 1985, 8511170
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.25 **7 Claims**



1. In a gas-powered resuscitator/ventilator device comprising a control unit having a high-impedance flow-regulation restriction and means for providing undiluted primary gas pulse flow therefrom, a patient valve connected to said restriction and including first means having a specific impedance for delivering said undiluted primary gas pulse flow to a patient at a predetermined rate, the improvement comprising said patient valve also including a diluent gas entrainment mixer that when operative dilutes the primary gas pulse flow received from the control unit, the patient valve including second means operative with the entrainment mixer to jointly provide a flow impedance to the primary gas pulse flow such that the primary gas pulse flow combined with the entrained diluent gas flow is delivered to the patient at substantially the same predetermined rate as the undiluted primary gas pulse flow and means for selectively connecting either the first or second means to a patient.

4,682,592

METHOD AND DEVICE FOR ACHIEVING REVERSIBLE MALE STERILIZATION

Knute E. Thorsgard, 3415 20th Ave. South, Apt. #210, Grand Forks, N. Dak. 58201

Filed Jan. 28, 1985, Ser. No. 695,188
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—303 R **1 Claim**

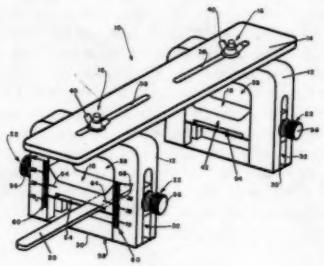
1. A contraceptive device for achieving reversible male sterilization comprising in combination:
(a) an elongated hollow tube having an outside diameter allowing it to be inserted into the urethra;
(b) an expandable elongated elastic cap attached to one end of said elongated hollow tube and forming a fluid tight seal with said elongated hollow tube;
(c) a plug attached to the other end of said elongated hollow tube forming a fluid tight seal with said elongated hollow tube and said elongated elastic cap;
(d) a flexible spring within said elongated hollow tube said flexible spring extending within said elongated elastic cap and holding it as an extension of said elongated hollow tube;
(e) a valve within said plug allowing selective ingress and egress of fluid, and;
(f) means cooperating with said valve to insert fluid within said tube to expand said elongated elastic cap to occupy the lumen and to prevent the passage of the sperm.

4,682,593

ADJUSTABLE BREAST BRIDGE FOR USE IN MULTIPLE-PLANE INTERSTITIAL BREAST IMPLANTS

Douglas W. Johnson, 8265 Riding Club Rd., Jacksonville, Fla. 33216

Filed Oct. 20, 1982, Ser. No. 435,514
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **9 Claims**



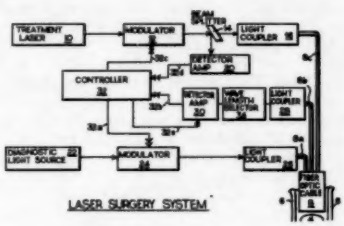
1. In a breast bridge for use in multiple-plane interstitial radioisotope breast implants, said bridge including a pair of upright support members, a transverse span member and means for mounting said span member to corresponding upper ends of said upright support members, the improvement comprising:
(a) at least one of said upright support members including a pair of laterally spaced-apart upright legs defining a channel therebetween, said legs of said at least one upright support member being bifurcated so as to define respective longitudinal guideways therein which are aligned with one another and extend through said legs so as to open away from said channel at outer opposite sides as well as into said channel at inner facing sides of said legs;
(b) means for receiving a marking tool being mounted to said at least one of said support members within said channel thereof for movement along spaced-apart upright legs of said support member toward and away from a lower end of said support member, said marking tool receiving means having outwardly-protruding guides on the opposite lateral ends thereof which extend into, and are slidable along, said guideways of said legs of said at least one support member; and
(c) means for adjustably securing said marking tool receiving means at any desired position along said support member, said means for adjustably securing said marking tool receiving means being mounted to said guides of said latter means at the outer sides of said legs and engagable with said outer leg sides for retaining said marking tool receiving means at any desired position along said support member.

4,682,594

PROBE-AND-FIRE LASERS

Walter Y. W. Mok, Palo Alto, Calif., assignor to MCM Laboratories, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 710,431, Mar. 11, 1985. This application Oct. 18, 1985, Ser. No. 788,949
Int. Cl.[4] A61B *17/35*
U.S. Cl. 128—303.1 8 Claims



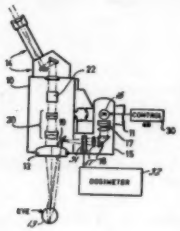
1. The method of destroying atheromatous plaque within an artery of a patient comprising the steps of initially administering to the patient a non-toxic atheroma-enhancing reagent which causes the plaque to have a characteristic optical property when illuminated with a given radiation, introducing a catheter system including fiberoptic cable means into the artery such that the distal end thereof is operatively opposite the plaque site, introducing into the proximal end of said fiberoptic cable means said given radiation, photoelectrically sensing at said proximal end said characteristic optical property to generate a control signal and directly under the control of said control signal transmitting via said cable means from said proximal end to said distal end, periodically occurring laser pulses until said characteristic optical property is no longer sensed.

4,682,595

ILLUMINANCE DOSAGE DEVICE

Peter G. Hoerenz, Hartsdale, N.Y., and Gerhard Mueller, Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Division of Ser. No. 715,408, Mar. 25, 1985. This application Apr. 11, 1986, Ser. No. 850,686
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 8 Claims



1. A dosimeter for use in limiting retinal exposure to field illumination in the course of an ophthalmic surgical procedure, said dosimeter comprising sampling means including a light detector producing an electrical-signal output responsive to a sampled fraction of the illumination, field-dosage integrating means including a clock timer and connected to the electrical-signal output of said detector, said integrating means integrating detector output as a function of time of illumination, presettable signal means for providing a predetermined reference signal value representing a predetermined maximum tolerable dosage level of integration value, and indicator means differentially responsive to said reference signal value and to the instantaneous integration value to produce a difference signal value which is indicative of remaining tolerable dosage.

4,682,596

ELECTROSURGICAL CATHETER AND METHOD FOR VASCULAR APPLICATIONS

Thomas O. Bales, Coral Gables, and Kevin W. Smith, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed May 22, 1984, Ser. No. 612,879
Int. Cl.[4] A61B *17/35*
U.S. Cl. 128—303.14 39 Claims

1. An electrosurgical plaque-resolving or tissue-eroding device having a distal end which is insertable within and along the lumen of a blood vessel and manipulated therethrough to a desired position without causing undue trauma where the device is operated to thermally resolve atherosclerotic plaque buildup or erode tissue in the blood vessel to re-establish desired blood flow through the blood vessel or to remove tissue therefrom, said device comprising: an elongate flexible hollow tubular body having a distal end, a proximal end, and a diameter smaller than the diameter of the vessel into which said device is inserted; first passage means within said tubular body for supplying a flushing fluid to the site where plaque or tissue is resolved or eroded; second passage means within said tubular body for evacuating, such as by suction, debris at the site of resolving plaque or eroding tissue from the site; a hollow tip member mounted at said distal end of said flexible hollow tubular body; an electrode adjacent to and in operative association with said hollow tip member for resolving plaque or eroding tissue, said tip member being beveled or rounded at the distal end of said device; means for supplying a high-frequency electrical current to said electrode for cutting tissue or coagulating body fluid; and means for sensing, from time to time, the amount of plaque or tissue at the site in the blood vessel.

4,682,597

SCLERAL DISSECTOR

William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48010

Filed Jul. 15, 1985, Ser. No. 754,943
Int. Cl.[4] A61F *17/32*
U.S. Cl. 128—305 6 Claims

1. A scleral dissector comprising:
an elongated handle,
a substantially planar cutting blade secured to and extending laterally outwardly from one end of the handle,
a substantially planar guide,

means for attaching said guide to said handle so that said guide is spaced from said blade and so that said guide and said blade both lie in planes which are substantially parallel to each other and transverse with respect to the axis of the handle, said guide having a surface facing the blade which is adapted to abut against the outer surface of the sclera of an eyeball during a scleral dissection.

4,682,598

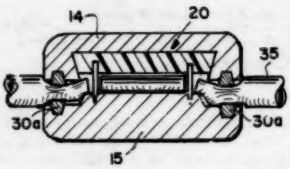
VASECTOMY INSTRUMENT

Dan Beraha, 912 Woodbriar Ct., Fort Walton Beach, Fla. 32548

Filed Aug. 23, 1984, Ser. No. 643,496

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—305 **21 Claims**



10. A surgical instrument for applying a pair of spaced apart ligating clips onto a tubular vessel and excising a segment of the vessel therebetween, comprising:

a disposable cutter block having a pair of spaced apart cutting blades, each blade having a cutting edge;

a pair of open ligating clips;

a first jaw adapted to receive said cutter block;

a second jaw opposing said first jaw and having a receiver surface for receiving said cutting edges of said cutter blades when said first and second jaws are closed, said first and second jaws having an open position and a closed position;

said first and second jaws having spaced apart grooves, said pair of open ligating clips disposed in said grooves with said first and second jaws in said open position;

handle means attached to said first and second jaws for closing said jaws to said closed position thereby closing said pair of clips onto a tubular vessel within said jaws and excising a segment of the vessel between said clips.

4,682,599

BASKET FORCEPS ASSEMBLY FOR ENDOSCOPE

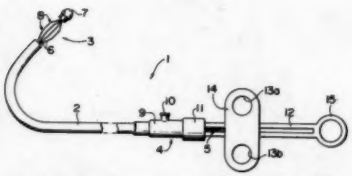
Yutaka Konomura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 19, 1985, Ser. No. 725,092

Claims priority, application Japan, Apr. 25, 1984, 59-61845[U]; Apr. 27, 1984, 59-63432[U]

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—328 **13 Claims**



1. A basket forceps assembly for use with an endoscope, comprising:

a flexible hollow sheath which can be passed through an insertable portion of an endoscope, said sheath having a front end, a hollow interior and an exterior;

a basket formed of a plurality of resilient wires, said basket being disposed so as to be movable into and out of the front end of said sheath and being adapted to hold foreign matter grasped therein;

a human actuable operating means connected to said basket so as to enable an operator to move said basket into and out of the front end of said sheath; and

a front end tip which is secured to said basket and adapted to tightly fit the front end of said sheath when said basket has been fully retracted into said sheath, said front end tip including a base that is fully disposed within said sheath when said basket is fully retracted into said sheath;

said front end tip having a passage formed therein which maintains communication between the hollow interior and the exterior of said sheath at a location forward of said base when the front end tip is tightly fitted into the front end of said sheath.

4,682,600

NON-INVASIVE METHOD AND APPARATUS FOR IN SITU DISINTEGRATION OF BODY CALCULI

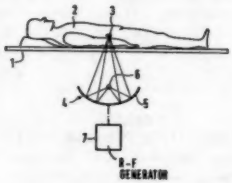
Werner Haas, Uttenreuth; Wolfgang Knuepfer, and Manfred Pfeiler, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,141

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425897

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—328 **5 Claims**



1. A method for non-body invasive disintegration of a calculus in the body of a patient comprising the steps of:

supporting the patient on a patient support bed;

generating electromagnetic radiation; and

focusing said electromagnetic radiation at said calculus in said patient.

4,682,601

ELECTRONIC DEVICE FOR CURATIVE STIMULATION OF THE BODY

Antonio Tagliavini, Via dei Canzi 26, Milano, Italy

Filed Jan. 14, 1985, Ser. No. 691,306

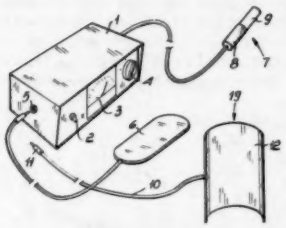
Claims priority, application Italy, Jan. 24, 1984, 20627/84[U]

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—422 **1 Claim**

1. A portable electronic device for curative stimulation of the body, comprising a box-like enclosure; a free running multivibrator in said box-like enclosure for generating stimulating electric pulses, said free running multivibrator having a multivibrator output; a decoupling transistor connected to said multivibrator output and having a decoupling transistor output; an amplifier transistor connected to said decoupling transistor output and having an amplifier transistor output, a pulse transformer having a primary and a secondary, said pulse transformer primary being connected to said amplifier transistor output and said pulse transformer secondary having an output; said output of said pulse transformer secondary being

coupled to sockets on said enclosure; electrode means to be coupled to said sockets for picking up said stimulating electric pulses; means for presetting the amplitudes of said stimulating electric pulses and for simultaneously presetting the frequencies thereof, said stimulating electric pulses having an amplitude which increases as the frequency thereof increases, the ratio of the value of said frequency in Hertz and of the value of said amplitude in volt being slightly greater than 3, the frequency range of said output pulses extending from 150 to 300 Hz and the amplitude range of said output pulses extending from 45 to 90 V.

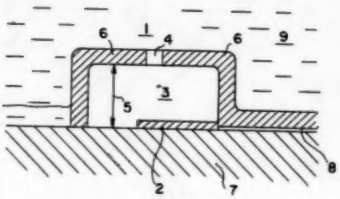


4,682,602

PROBE FOR MEDICAL APPLICATION

Otto Prohaska, Ann Arbor, Mich., assignor to Ottosensor Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 373,207, Apr. 29, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 748,231
Claims priority, application Austria, May 7, 1981, 2029/81
Int. Cl.⁴ A61B *5/00, 5/04;* A61N *1/05*
U.S. Cl. 128—635 **24 Claims**



1. A probe for registering or influencing tissue activities and properties of chemical samples comprising a substrate having a supporting surface; means including a cover layer having a thickness of 0.5 to 10 μm. carried on the supporting surface of said substrate, said means and a portion of the supporting surface of said substrate forming a chamber which is bounded on one side by the supporting surface and on an opposed side by a wall of said cover layer which is spaced from the supporting surface by not more than about 30 μm., the chamber being closed except for an aperture in the last-named wall which enables communication between the chamber and the exterior of the probe; an electrode or transducer which is substantially less than 30 μm. in thickness carried on the supporting surface of said substrate inside the chamber; means including a conductor mounted on the probe, inside the chamber, and operable to conduct a signal between said electrode or transducer and registering or influencing circuitry.

4,682,603

APPARATUS AND METHOD FOR RECORDING MONOPHASIC ACTION POTENTIALS FROM AN IN VIVO HEART

Michael R. Franz, Warburghof 12, 3000 Hannover 61, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,697
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—642 **25 Claims**

1. An apparatus for measuring monophasic action potentials in an in vivo beating heart, comprising:

a probe having a tip portion;

a first electrode mounted on a terminal free end of said tip portion, said first electrode having a portion exposed to ambient;

a second electrode spaced along said tip portion from said first electrode for supplying a reference potential signal; and

means on said probe which is spring loaded for holding said first electrode in contact with tissue of a beating heart with a positive force of approximately 20–30 g without causing macroscopic damage to said heart tissue and orienting said probe such that said second electrode is spaced from said heart tissue.

4,682,604

COINCIDENCE COUNTING EMISSION TOMOGRAPHIC PROBE: METHOD AND APPARATUS

Alain L. Fymat, Pasadena; Wai-Nang P. Lee, Van Nuys, and Moses A. Greenfield, Sherman Oaks, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 25, 1985, Ser. No. 705,916
Int. Cl.⁴ A61B *6/00*
U.S. Cl. 128—659 **17 Claims**

1. A nuclear medicine apparatus for analyzing particular characteristics of a body organ into which radiopharmaceuticals have been introduced, said radiopharmaceuticals causing a plurality of internally generated radioactive emissions from said organ, said apparatus comprising:

a plurality of pairs of adjacent radiation detector means,

each pair of detector means being capable of detecting at least two different internally generated radioactive emissions, of respectively different energy levels, from said organ and generating a plurality of separate electrical signals, each of said separate signals generated in response to a different detected emission; and

electronic means coupled to said detector means, said electronic means responsive to coincident reception of said two separate electrical signals, representative of said different detected emissions;

means for processing and analyzing the levels of the coincident reception, coupled to the output of said electronic means, said processing and analyzing means positioned at least every 45 degrees around, the organ being monitored throughout along an arc of at least 180 degrees;

whereby the maximum and minimum intensity of angular radiation may be determined.

4,682,605

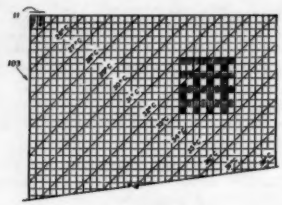
LIQUID CRYSTAL MATRIX FOR EXTENDED RANGE HIGH RESOLUTION TEMPERATURE MAPPING

Kent C. Hoffman, Cockeysville, Md., assignor to Murray Electronics Associates Limited, Hunt Valley, Md.

Filed Oct. 2, 1985, Ser. No. 783,093

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—736 **31 Claims**



1. An apparatus for measuring and visually displaying temperature gradients over an extended temperature range as color-coded contours of constant temperature, said apparatus comprising;

a first plurality of arrayed discrete deposits of liquid crystals sensitive in a first temperature range;

a second plurality of arrayed discrete deposits of liquid crystals sensitive in a different second temperature range;

said first and second pluralities of discrete deposits of liquid crystals being separate from one another but disposed in co-located respective sub-arrays on a common substrate to form a composite overall array of said discrete deposits in a common liquid crystal layer which responds with said color-coded contours over an extended temperature range corresponding to a combination of said first and second temperature ranges;

said discrete deposits being of sufficiently small size and being of sufficiently large number to directly present color-coded contours of constant temperature wherein a predetermined color produced by a blended color mixture of said first and second arrayed deposits represents a corresponding predetermined temperature.

4,682,606

LOCALIZING BIOPSY APPARATUS

Vincent H. DeCaprio, 6 Payne Rd., Elmsford, N.Y. 10523

Filed Feb. 3, 1986, Ser. No. 825,546

Int. Cl.[4] A61B *10/00*

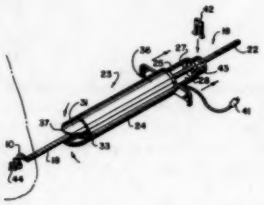
U.S. Cl. 128—754 **10 Claims**

1. An apparatus for localizing and excising a mass from a patient's tissue comprising:

a surgical needle having first and second ends, and said first end of said surgical needle being insertable into said mass of said patient's tissue;

a cork screw means having a hollow central shaft, a worm element attached to a first end of said shaft and a removable handle connected to a second end of said shaft, said cork screw means fitting over said surgical needle and said worm element encircling and localizing said mass when said cork screw means is inserted into said patient's tissue;

a guiding extension rod having first and second ends, and said first end of said guiding extension rod being connected to said second end of said hollow central shaft of said cork screw means when said removable handle is removed;



a cutting instrument having an outer barrel and an inner cylinder concentrically accommodated inside said outer barrel, a pair of arcuate cutting jaws being attached to a first end of said outer barrel and a first end of said inner cylinder, said inner cylinder having a channel through which said cork screw means and said guiding extension rod extend, movement of said outer barrel relative to said inner cylinder causing said arcuate cutting jaws to close and to cut said mass from said patient's tissue, and said mass, said guiding extension rod and said cork screw means being removable through said channel of said inner cylinder of said cutting instrument after said mass is cut from said patient's tissue.

4,682,607

WIRE GUIDE

Vincent L. Vaillancourt, Livingston, and Stephen Kocanowski, Middlesex, both of N.J., assignors to VLV Associates, East Hanover, N.J.

Filed Dec. 2, 1985, Ser. No. 803,719

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—772 **12 Claims**

1. A wire guide for a catheter comprising a length of stranded wire having a flexible section of a diameter of from about 0.008 inches to 0.062 inches extending to a distal end and a rigid section extending from said flexible section to a proximal end and a nose at said distal end of said wire.

4,682,608
APPARATUS FOR MEASURING VISCOELASTIC PROPERTIES OF SKIN IN VIVO

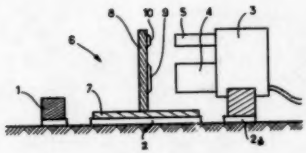
Jean P. De Rigal, Claye Souilly; Jean-Luc M. Leveque, Le Raincy; Laurent B. Rasseneur, Thorigny S/Marne, and Marie-Jeanne Losch, Stains, all of France, assignors to "L'Oreal", Paris, France

Continuation of Ser. No. 648,690, Sep. 10, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,572

Claims priority, application France, Sep. 13, 1983, 83 14548

Int. Cl.[4] G10N *3/38*

U.S. Cl. 128—774 **7 Claims**



1. In apparatus for measuring in vivo at least one viscoelastic property of skin in a region of the skin, the said apparatus comprising:

(a) a movable assembly;

(b) means for fixing the movable assembly to the region of skin to be tested;

(c) a base;

(d) an electromagnetic exciter carried by said base and intended to subject the movable assembly and the region of skin to a sustained vibration relative to the base in a direction substantially parallel to the region of skin to which the movable assembly is to be fixed;

(e) an electronic circuit incorporating means for feeding the electromagnetic exciter with low-frequency current, and a proximity sensor for detecting the vibrations of the movable assembly and for producing an image signal of these vibrations;

(f) means for displaying and/or recording the change of the image signal as a function of the exciter feed frequency, in order to determine the resonance frequency of the assembly subjected to the sustained vibration, and to deduce therefrom at least one viscoelastic property of skin;

the improvement wherein:

(g) the base is a guard formed by a frame of a nonmagnetic material, said frame extending in a plane and including a side, said electromagnetic exciter including an electromagnetic coil having an axis extending parallel to said plane of said frame and perpendicular to said side of said frame, said side of said frame supporting said electromagnetic exciter;

(h) said fixing means include double-sided adhesive tape for fixing the frame removably on the skin whereby the skin bounded within the frame in the region of skin to be subjected to the sustained vibration;

(i) the movable assembly including a vibrating mass intended to be fixed within the frame;

(j) the fixing means further include further double-sided adhesive tape having one face adhered to said vibrating mass and the other face adapted to be adhered on the skin to be measured; and

(k) the vibrating mass further carries a bead of a magnetic material which is positioned for co-operating with the exciter when the first mentioned and further double-sided adhesive tapes are fixed to the skin and the guard and the vibrating mass are fixed on the tapes;

said vibrating mass incorporating (a) a plate fixed to the double-sided adhesive tape, and (b) at least one mounting fixed to the plate said mounting extending substantially perpendicular to said piate and carrying said magnetic bead, and said frame enclosing an interior space and said electromagnetic exciter extending in overhanging relationship with a portion of said interior space of said frame.

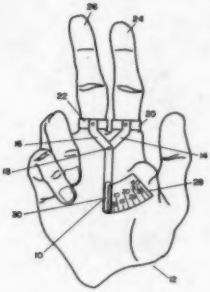
4,682,609
CERVICAL-DILATION METER

Natan Parsons, 71 Babcock St., Brookline, Mass. 02146

Filed Nov. 25, 1985, Ser. No. 801,640

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—775 **6 Claims**



1. For measuring the cervical dilation during the initial stages of labor, a dilation meter comprising:

A. first and second pivot arms pivotably mounted to each other for pivoting with respect to each other about a common pivot axis extending through pivot points on the pivot arms;

B. first and second rings provided on the first and second pivot arms, respectively, and spaced from the pivot points on the respective pivot arms, the rings being adapted to fit simultaneously on the bases of adjacent fingers of a user; and

C. calibrated measurement means for providing a quantitative indication of the lateral extension of the tips of fingers whose bases are positioned in the rings, the measurement means comprising:

i. a scale on the first pivot arm having a plurality of spaced scale indicia indicating different degrees of cervical dilation, and

ii. an indicator positioned with respect to the scale to indicate the indicium that indicates the cervical dilation that corresponds to the lateral extension of the tips of the fingers whose bases are positioned in the rings.

4,682,610
WATER PIPE

Kenneth W. Freelain, 1630-A Beekman Pl., NW., Washington, D.C. 20009

Filed Dec. 6, 1985, Ser. No. 805,803

Int. Cl.[4] A24F *1/30*

U.S. Cl. 131—173 **9 Claims**

1. A water pipe having an opening in a top of a bottle having a liquid containing a chamber beneath an upper air portion of the bottle for utilizing a liquid in the liquid containing chamber of the bottle to cool smoke from a smoking material, further comprising

a metal cylinder extending from the open top of the bottle downwardly beneath a liquid level of the liquid in the liquid containing chamber to near the inside bottom of the bottle,

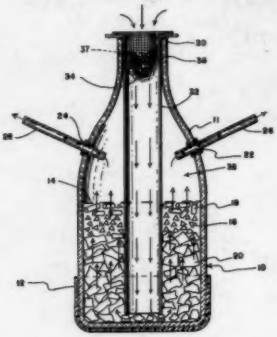
smoke withdrawal means in fluid communication with the upper portion of the bottle for withdrawal of smoke from the bottle,

a metal screen disposed within the metal cylinder defining an upper cavity for supporting the smoking material,

pieces of solid material disposed within the liquid containing

chamber, which pieces are dimensionally stable during use and some of which pieces have a density greater than the liquid and some which pieces have a density less than the liquid,

the pieces being present in the liquid containing chamber are so constructed and arranged to create a tortuous path of



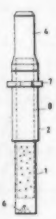
the smoke drawn through the liquid and thus improve impacting contact between the liquid and the smoke by it being purified thereby aiding in the removal of carcinogens and other materials which may be harmful to the smoker by accomplishing such action upon the smoke before the smoke enters the mouth and lungs of the smoker.

4,682,611

PORTABLE CIGARETTE SAFETY ASH TUBE AND EXTINGUISHER

Wuu Chiu-Rong, c/o Y. L. Yang P.O. Box 865, Kaohsiung, Taiwan

Filed Apr. 18, 1985, Ser. No. 724,812
Int. Cl.[4] A24F *3/02, 7/02, 47/00*
U.S. Cl. 131—256 **2 Claims**



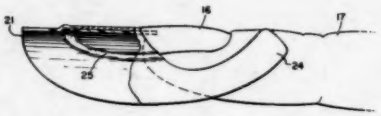
1. A portable cigarette ash tube in combination with a cigarette holder and an extinguisher comprising an outer tubular body having a first end and a second end; a mouthpiece incorporating said cigarette holder being removably connectable to the first end of said outer tubular body; an inner tubular body having a first and second end; a cone shaped blade scratcher being secured to the first end of said inner tubular body; said scratcher having its cone blade being within said inner tubular body and pointing in the direction of said inner tubular body second end; said outer tubular body having its respective second end telescopically fit over said second end of said inner tubular body; said tubular bodies rotatable about a common longitudinal axis with respect to each other; whereby when said mouthpiece is removed an open ash tube end is formed which serves for the escape of ashes produced when the tubular bodies are connected to said mouthpiece and said scratcher rotates down onto the ember end of a lit cigarette extinguishing said cigarette.

4,682,612

NOVEL PROCESS AND ARTICLE FOR PREPARING ARTIFICIAL NAILS

James T. Giuliano, Ft. Lauderdale, Fla., assignor to Zotos International, Inc., Darien, Conn.

Filed Aug. 12, 1983, Ser. No. 522,536
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] A45D *40/30*
U.S. Cl. 132—73 **27 Claims**



1. Article for preparing artificial nails comprising, in combination:

(1) an organic solvent-free photocurable liquid composition which, upon exposure to actinic radiation, can cure to provide a hard flexible water-insoluble plastic;

(2) a form comprising a liquid-impermeable flexible sheet material adapted to engage a digit and having an area adapted to receive said liquid composition in a defined configuration; and

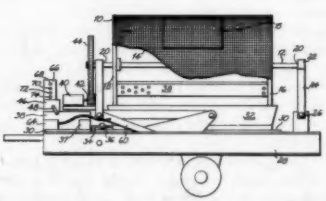
(3) a source of actinic radiation which, upon exposure thereto of said digit having said form containing said composition in engagement therewith, can provide a hard plastic artificial nail.

4,682,613

LOOSE FILL MEDIA CLEANING APPARATUS

Anthony DeLoach, Sarasota, Fla., assignor to Water Equipment Services, Inc., Sarasota, Fla.

Filed Jul. 23, 1986, Ser. No. 888,386
Int. Cl.[4] B08B *3/06*
U.S. Cl. 134—58 R **17 Claims**



1. Loose fill media cleaning apparatus comprising:

a foraminated hollow cylinder having a shaft extending along its longitudinal axis;

an imperforate disk positioned at each end of said cylinder providing end walls for said cylinder and support for said cylinder;

a first bearing at one end of said shaft and a second bearing at the other end of said shaft for supporting said shaft for rotation about its axis;

said cylinder having a loose fill media filling port with a closure in the cylinder wall, and said cylinder having in said disk at said one end a loose fill media removing port with a closure;

first bearing support means having a laterally extending bearing support beam with a leg depending from each end of said beam whereby an area for access to said loose fill

removing port is provided between said depending legs and below said beam;

an apparatus support base;

pivotal support means pivotally connecting said depending legs of said first bearing support means to said apparatus support base;

hoist means for moving said second bearing between a position where it is at the same level as said first bearing and a position where it is elevated above said first bearing;

a liquid holding and collecting pan positioned below said cylinder on said apparatus support base;

a liquid storage tank on said support base;

first pump means for transfering liquid from said liquid holding and collecting pan to said liquid storage tank;

second pump means for delivering liquid from said liquid storage tank at elevated pressure;

propulsion means for rotating said cylinder on said shaft at a relatively slow speed; and

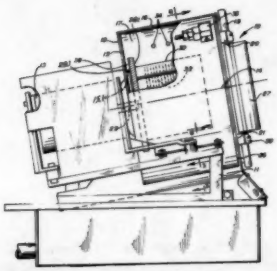
switch means for controlling the operation of said hoist means, said first and second pump means, and said propulsion means whereby an operator can control the times for operation.

4,682,614

WAFER PROCESSING MACHINE

James M. Silvernail, Maple Plain, and Dallas J. Schneider, Cologne, both of Minn., assignors to FSI Corporation, Chaska, Minn.

Filed Jul. 26, 1985, Ser. No. 759,426
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—99 **12 Claims**



1. A centrifugal processing machine for spray processing with liquid and gaseous fluids silicon wafers and the like in the manufacture of integrated circuit chips, comprising

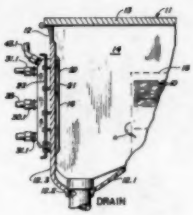
a housing defining a processing chamber and having a high speed rotor means in the housing to mount and revolve such wafers in one direction about a rotation axis, the housing having an access means to accommodate the insertion and removal of such wafers for loading and unloading the rotor means, means for introducing the liquid and gaseous fluids into the housing, the housing having a smoothly contoured peripheral wall with an elongate portion extending along the rotor axis, said elongate portion having an offset with an elongate drain slot therein and facing circumferentially of the peripheral wall in said one direction, and shroud means on the exterior of the peripheral wall and enclosing said elongate portion and offset and communicating with the drain slot to receive the liquid and gaseous fluids discharged through the slot for delivery to a drain.

4,682,615

RINSING IN ACID PROCESSING OF SUBSTRATES

Don C. Burkman, Excelsior; David D. Schumacher, Plymouth, and Charlie A. Peterson, Waconia, all of Minn., assignors to FSI Corporation, Chaska, Minn.

Filed Jul. 2, 1984, Ser. No. 626,702
Int. Cl.[4] B08B 3/08
U.S. Cl. 134—102 **8 Claims**



1. In a chemical processing system for chemical processing of wafer substrates in the production of electronic devices by sequential application of various liquid chemicals and application of rinsing water between the various chemicals, improved process apparatus comprising

confining means defining a closed chamber to accommodate multiple processing steps for the substrate and having support means carrying such wafer substrates in the chamber for processing,

a spray head means in the chamber to direct liquid spray into the chamber for application to the substrates, the spray head means having a liquid chemical supply passage and liquid chemical spray orifices communicating with the chemical supply passage, the spray head means also having a rinsing water supply passage and water spray orifices communicating with the water supply passage and being spaced from said chemical spray orifices,

a chemical supply line connected with the chemical supply passage,

liquid chemical source means including a valved connection with the chemical supply line and supplying liquid chemical thereto,

a rinsing water source means having separate valved connections to the chemical supply line and to the water supply passage respectively,

a water flow control restriction between the chemical supply line and the rinsing water source means, whereby to facilitate purging the chemical supply line, chemical supply passage and chemical spray orifices of liquid chemical by restricted flow of water as water is also supplied to the water supply passage and water spray orifices for rinsing the wafer substrate, and

drain means including a drain valve having a discharging connection to a drain and having an inlet connection to the chemical supply passage of the spray head means for draining liquid from the chemical supply passage and the chemical supply line and for allowing free flow of rinsing water and diluted chemicals from the chemical passage and chemical line and to divert quantities of the rinsing water from the chemical spray orifices while allowing a dribble of flow through the orifices without being cast from the orifices into the substrates.

4,682,616

UMBRELLA WITH A MECHANISM FOR LOCKING AND RELEASING A SLIDER

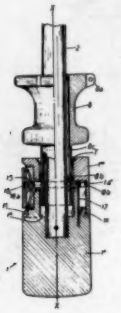
Tilmann Schultes, Solingen, Fed. Rep. of Germany, assignor to Kortenbach Verwaltungs- und Beteiligungsgesellschaft mbH & Co., Solingen, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,144

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531952

Int. Cl.[4] A45B *25/14, 25/08*

U.S. Cl. 135—38 5 Claims



1. In an umbrella of the kind having a stick; a handle at a lower end of said stick; a canopy framework which is adapted to support a canopy and which is opened and closed by means of a slider which slides to and fro along said stick; and manually releasable latching means for fixing said slider in the closed position of said canopy framework, said means comprising a latching member engagable in a notch; the improvement wherein said notch is provided in a guide sleeve of said slider and said latching member comprises a bolt which is carried by said handle and has a ring part surrounding said guide sleeve in said closed position and engagable with said notch; said bolt being slidable transversely to the axis of said stick against spring action for disengagement thereof from said guide sleeve.

4,682,617

SHORTENABLE UMBRELLA HAVING A TELESCOPIC STICK

Tilmann Schultes, Solingen, and Klaus Stiller, Langenfeld, both of Fed. Rep. of Germany, assignors to Kortenbach Verwaltungs- und Beteiligungsgesellschaft mbH & Co., Solingen, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,194

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531951

Int. Cl.[4] A45B *25/14*

U.S. Cl. 135—38 9 Claims

1. A shortenable umbrella having a telescopic stick comprising at least lowermost and next lowermost stick parts and a latch for latching said stick parts in a mutually extended position; a crown fixed to one end of said stick; a hollow handle fixed to said lowermost stick part; a slider having a release actuator therefor and being slidable on said stick; and a framework adapted to support a canopy and comprising spokes and struts hinged to and carried by said crown and slider; said hollow handle receiving said slider and release actuator upon shortening of said stick when said framework is closed and after release of said latch; wherein said latch is releasable by final sliding of said slider along said stick towards said handle when, in the course of final closing of said framework and, in use, a canopy supported thereby, are manually bundled around, and compressed towards, said stick.

4,682,618

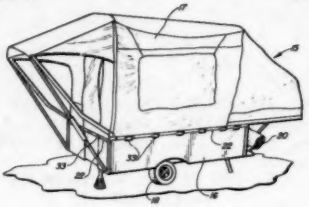
CANVAS RETAINING ASSEMBLY FOR CAMPING TRAILER

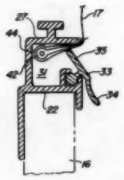
David J. Zwick, Stoystown, Pa., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Jun. 24, 1985, Ser. No. 748,238

Int. Cl.[4] E04H *15/08, 15/64;* A41F *1/00*

U.S. Cl. 135—89 12 Claims





1. A canvas retaining assembly for a camping trailer, the camping trailer having a trailer body including at least one side wall, the canvas retaining assembly comprising a canvas canopy covering the trailer body, an elongated channel mounted on the top of the side wall and having a top wall and a side opening below the top wall, the canvas canopy having a bottom edge portion which extends through the side opening in the channel and a generally flat portion which extends upwardly from the edge portion and which engages the top wall of the channel, and a latch pivotally mounted on the channel adjacent the mouth of the side opening therein and having a latching portion which extends from the pivot axis of the latch into the side opening in the channel, the latch being pivotable between an unlatched position in which the latching portion is spaced from said top wall of the channel a distance sufficiently to permit the edge portion of the canvas to be inserted laterally into and withdrawn laterally from the channel through said side opening and a latching position in which the latching portion is spaced from said top wall of the channel a distance less than the thickness of the edge portion and the edge portion is positioned in the side opening in the channel inwardly of the pivot axis of the latch so that the edge portion wedges between

the latching portion and said top wall and is prevented from being withdrawn from the channel.

4,682,619

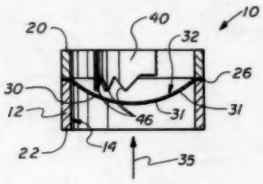
REVERSE-BUCKLING RUPTURE DISK

Miner Clift, and Bill Engelhardt, both of P.O. Box 1327, Broken Arrow, Okla. 74012

Continuation of Ser. No. 510,568, Jul. 5, 1983, abandoned. This application Apr. 14, 1986, Ser. No. 851,441

Int. Cl.[4] F16K *17/14*

U.S. Cl. 137—68.1 **10 Claims**



1. A rupture disk assembly comprising:

a. a cylindrical housing with an inner cylindrical wall defining a central bore for conveying flow;

b. a frangible concave-convex disk supported at its edge portions by the housing, closing the bore, the disk being designed to resist pressure on the convex side up to a predetermined pressure and then collapsing after the predetermined pressure is reached; and

c. an elongated U-shaped knife blade comprising a flat blade body with an upstream leading edge and a downstream trailing edge that are spaced from the wall of the bore and a plurality of serrated teeth lining the leading edge, for perforating the disk when it collapses, the ends of the blade being connected to the inner surface of the housing means downstream of the disk.

4,682,620

CLEAN-GAS CONTINUOUS-FLOW INTERMEDIATE STORAGE OR ACCUMULATOR PLANT

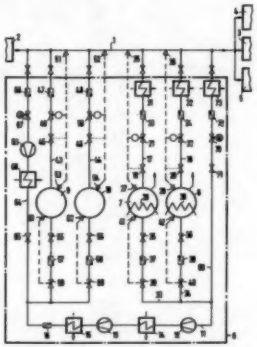
Konrad Goebel, Erlangen, and Ulrich Schiffers, Eckental, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,627

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422885

Int. Cl.[4] G05D *16/00*; F17D *1/20*

U.S. Cl. 137—110 **14 Claims**



1. Clean-gas continuous-flow intermediate storage plant having at least one high-pressure accumulator, at least one low-pressure accumulator and at least one pressure-increasing compressor connected therein, and having a connection with a gas distribution line, the low-pressure accumulator being constructed for a range of operation below a minimum pressure of the gas distribution line, and the high-pressure accumulator being constructed for a range of operation above a maximum pressure of the gas distribution line, comprising an input line to the low-presure accumulator, and an output line from the high-pressure accumulator both connected to the gas distribution line, a connecting line connecting the low-pressure accumulator and the high-pressure accumulator to one another and having the at least one pressure-increasing compressor inserted therein, and valves built into the input line to the low-pressure accumulator and the output line from the high-pressure accumulator as well as into an output line from the low-pressure accumulator and an input line to the high-pressure accumulator and respective pressure sensors connected to said valves for controlling said valves, the pressure sensor connected to the respective valve in said input line to the low-pressure accumulator being connected to the gas distribution line and being constructed for opening the respective valve in said input line to the low-pressure accumulator at pressures above a given maximum pressure in the gas distribution line, the pressure sensor connected to the respective valve in said output line from the high-pressure accumulator being connected to the gas distribution line and being constructed for opening the respective valve in said output line from the high-pressure accumulator at pressures below a given minimum pressure in the gas distribution line.

4,682,621

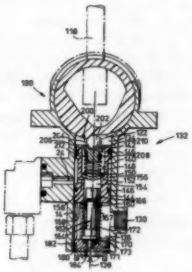
MODULATOR VALVE

Graham V. Kipling, Agincourt, Canada, assignor to Diesel Equipment Limited, Toronto, Canada

Continuation of Ser. No. 748,442, Jun. 25, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,942

Int. Cl.[4] G05D *16/10*

U.S. Cl. 137—116.3 **1 Claim**



1. A pneumatic modulator valve comprising:

(a) a housing having a cylinder formed therein, said cylinder having first and second ends and a longitudinal axis extending therebetween,

(b) an air inlet passage opening into said first end of said cylinder and an air outlet passage opening from said second end of said cylinder,

(c) a modulator member slidably mounted in said cylinder for axial movement along said cylinder between a valve closing position and a valve opening position, said modulator member having a bore extending longitudinally thereof, a plug mounted in said bore and dividing it into a recess which opens toward said first end of said cylinder and a modulator chamber disposed toward said second end of said cylinder said modulator chamber having a

modulator output passage opening into said second end of said cylinder.

(d) an air input passage formed in said modulator member and communicating between said air inlet passage of said housing and said modulator chamber,

(e) a valve member slidably mounted on said modulator member for movement in the direction of the longitudinal axis of said cylinder between an extended position and a retracted position, said valve member having a proximal end and a distal end, said valve member having a valve closure head located in said modulator chamber for closing said output passage of said modulator when said valve member is in said extended position and to open said output passage of said modulator when said stem is moved towards its retracted position relative to said modulator member,

(f) a first biasing spring located externally of said modulator chamber and arranged to bear against said valve member and said modulator member to urge said valve member toward its extended position with respect to said modulator member,

(g) valve arresting means retained at said second end of said cylinder against movement with respect to said cylinder for arresting the movement of said valve member while permitting continued movement of said modulator member towards said second end of said cylinder thereby to open said modulator passage to permit air to flow through said valve,

(k) modulator means in said housing for movement between a valve closing position and a valve opening position, said modulator control means comprising an actuator cam member mounted for rotation about an axis extending at right angles to said longitudinal axis, a second compression spring mounted in said recess of said modulator member and having one end bearing against said plug, a support member mounted at the other end of said second compression spring, a contact member seated on said support member and bearing against said cam,

(l) a manually engageable lever mounted on said actuator cams for use in moving said cam to cause it to displace the modulator member toward said second end of said cylinder to an extent sufficient to move the modulator member relative to the valve member after the movement of the valve member has been arrested by the arresting means until the first valve closure member is spaced from the modulator member to open said modulator output passage, said modulator member being free to reciprocate to and fro in said cylinder to balance the pressure in said second end of said cylinder with respect to the load applied by said first biasing means to modulate the air flow through said valve.

4,682,622

PRESSURE REGULATING VALVE

Kent Weber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1985, Ser. No. 807,608
Int. Cl.[4] G05D *16/00*; F16K *31/126*
U.S. Cl. 137—154 **9 Claims**

1. A liquid pressure regulating valve for a two phase thermal management system, comprising:

a valve body having a liquid inlet port, a regulated liquid outlet port for supplying a liquid to be partially vaporized to a variable degree into both a liquid and a vapor state, with the degree of vaporization being dependent upon a variable heat load applied to said liquid downstream of said outlet port, and a vapor pressure sensing port;

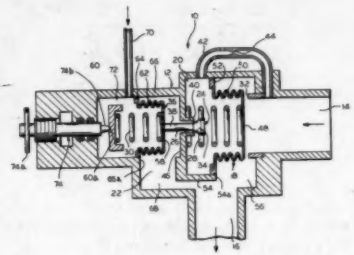
a first valve member adapted to move between an open position and a closed position to open and close said liquid inlet port;

a first pressurized liquid chamber communicating directly with said liquid inlet port through a liquid conduit having a restriction therein, said first pressurized liquid chamber being disposed such that liquid pressure therein tends to close said first valve member;

a second pressurized liquid chamber communicating directly with said regulated liquid outlet port, said second pressurized liquid chamber being in selective communication with said first pressurized liquid chamber;

a second valve member adapted to move between an open position and a closed position to open and close a liquid passage between said pressurized liquid chambers;

said second pressurized liquid chamber being disposed such that liquid pressure therein tends to close said second valve member; and



a pressurized vapor chamber communicating directly with said vapor pressure sensing port, said vapor pressure sensing port communicating directly with said vapor produced by partial vaporization of said liquid in said two phase thermal management system, said pressurized vapor chamber being disposed such that vapor pressure therein tends to open said second valve member;

said first and second valve members being automatically positioned in relation to said respective open and closed postions to maintain a preselected pressure in said regulated liquid outlet port.

4,682,623

TOOL FOR REMOVAL OF DEBRIS FROM PIPE CONTAINING GAS UNDER PRESSURE

Jerome Scherer, 1020 N. Missouri, Cape Girardeau, Mo. 63701

Filed Jan. 2, 1987, Ser. No. 83
Int. Cl.[4] F16K *51/00*; B08B *9/04*
U.S. Cl. 137—317 **13 Claims**

1. A tool for removal of debris from a transmission pipe containing a gas under pressure, comprising, a tube means, said tube means having an opening at one end, and which end and

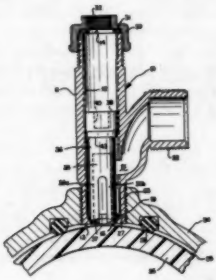
its opening are provided for disposition into the pipe containing the gas under pressure, and functioning to discharge any debris contained within the pipe through its coneyance with the pressurized gas as it releases through the tube means, a pipe connector attaching with said pipe, a reducer securing with said pipe connector, a fitting securing within said reducer, a movable and universal mounting means seated within said fitting, said tube slidably mounted within said mounting means, whereby the shifting of said tube means within said mounting means, providing for a universal movable arrangement of the said tube and its opened end for alignment with any proximate debris within and along the bottom of the said pipe and effecting its removal through its entrainment within any pressurized gas discharged through the said tube means.

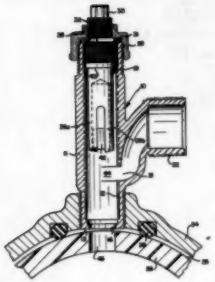
4,682,624

SELF-DRILLING VALVE

Clarence C. Turner, Marion, Ind., assignor to The Ford Meter Box Company, Inc., Wabash, Ind.

Filed Aug. 13, 1986, Ser. No. 895,959
Int. Cl.[4] F16K *43/00*; F16L *55/10*
U.S. Cl. 137—318 **13 Claims**





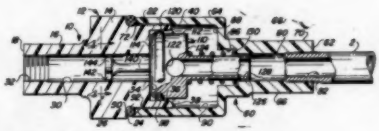
12. A fitting for tapping into a plastic water main comprising a housing threaded at its forward end for mounting in a saddle, said housing providing a through passage having a valve seat at its forward end and threaded from said valve seat to its rearward end, a second passage in said housing open to said first passage intermediate its ends, a cutter providing a threaded head at its rearward end mating with said threads of said first passage, said cutter also providing a shank extending forwardly from said head providing cutting edges at the forward end thereof for cutting through a plastic water main, said shank providing a tubular forward end for receiving a coupon cut from the wall of a water main, and seal and guide means formed of a seal material, said seal and guide means being positioned in said valve seat adjacent the forward ends of said cutter laterally positioning said forward end prior to and during cutting into a water main, said seal and guide means retracting along with said cutter when said cutter moves rearwardly along said passage to provide communication between said forward end and said second passage, said seal and guide means being positioned in said valve seat and providing a fluidtight joint between said cutter and said forward end of said housing when said cutter is fully extended.

4,682,625

SPRINGLOADED SHUTOFF VALVE APPARATUS

Gilman G. Christopher, 924 W. 11th Pl., Mesa, Ariz. 85201

Filed Aug. 4, 1986, Ser. No. 892,327
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—538 **7 Claims**



1. Valve apparatus for a fluid, comprising, in combination:
first housing means;
first bore means in the first housing means, including
a first valve bore having a first diameter,
a first guide bore communicating with the first valve bore through which fluid flows to the first valve, and
a first shoulder between the first valve bore and the first guide bore;
second housing means secured to the first housing means;
second bore means in the second housing means, including
a second valve bore communicating with the first valve bore and having a second diameter which is greater than the first diameter of the first valve bore,
a spring bore communicating with the second valve bore, and
a second guide bore communicating with the spring bore; and valve means movable in the first and second housing means, including
a valve element movable in the first and second valve bores between a closed position in the first valve bore and an open position in the second valve bore,
a first face on the valve element against which fluid pressure may bear to urge the valve element to the open position and which, when disposed on the first shoulder, defines a fully closed position,
a guide rod secured to the first face and extending into the first guide bore for guiding the valve element as the valve element moves in the first and second valve bores,
a second face on the valve element against which fluid back pressure may bear to urge the valve element to its closed position in the first valve bore,
a guide tube secured to the second face and extending into the second guide bore for guiding the valve element as it moves in the first and second valve bores,
a fluid bore in the guide tube through which fluid flows,
spring means disposed about the guide tube and extending into the spring bore and between the second face and the spring bore for urging the valve element to its off position in the first valve bore,
passage means extending through the valve element and communicating with the fluid bore through which fluid flows to the fluid bore when the valve element is at least partially out of the first valve bore and into the second valve bore, and
sealing means extending circumferentially about the valve element between the first face and the passage means for sealing the valve element when the sealing means and the adjacent portion of the valve element is disposed in the first valve bore to prevent the flow of fluid from the

first and second valve bores into the passage means and the fluid bore.

4,682,626

SINGLE-LEVER WATER MIXER FITTING

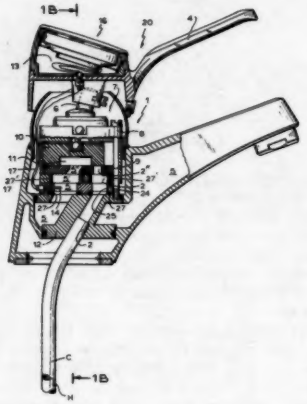
Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

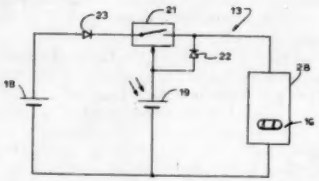
Filed Mar. 4, 1986, Ser. No. 835,916

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3507559; Mar. 12, 1985, 3508680; Apr. 16, 1985, 3513549

Int. Cl.[4] F16K *37/00*; H01H *35/00*

U.S. Cl. 137—551 15 Claims





1. A water mixer fitting, of the single-handle type, having hot and cold water inlets in fluid communication with a water discharge passage, said discharge pasaage including a mixing chamber in which mixed not and cold water is discharged through a water outlet opening in sdid discharge passage, said mixer fitting comprising:

valve means, operably coupled to said handle, for controlling water volume and for proportioning hot and cold water through said discharge passage;

a temperature sensor, operably coupled to said water discharge passage, and being in fluid communication therewith;

an indicator means mounted on said fitting and including a numeric temperature display electrically connected to a temperature measuring circuit and said temperature sensor;

said temperature measuring circuit including a battery as a first power source and at least one solar cell as a second power source, and having switching means for selectively operating said first and second power sources, said second power source being operable only above a given predetermined light intensity.

4,682,627

MANIFOLDING SYSTEMS FOR GAS CONTAINERS

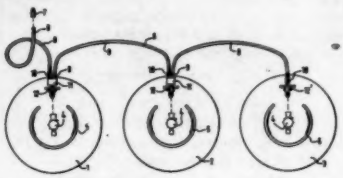
Graham H. B. Cooper, Hailey, Near Witney, and John A. Williams, Brize Norton, both of England assignors to Supergas Ltd, United Kingdom

Filed May 7, 1985, Ser. No. 731,647

Claims priority, application United Kingdom, May 23, 1984, 8413203

Int. Cl.[4] F17C *1/00*

U.S. Cl. 137—572 9 Claims



1. A manifolding system for plurality of gas containers, containing gas under pressure or liquefied gas similarly under pressure, enabling gas to be supplied to an outlet, comprising a plurality of hoses for connecting said outlet with said gas containers serially, each hose including a pressurized gas flow, non-return valve at its end nearer to said gas outlet and including a pressurized gas excess-flow actuated shutdown valve at its other end.

4,682,628

FAUCET SYSTEM

Stephen A. Hill, 8 Heatherbrae Avenue, South Caulfield, Victoria, Australia

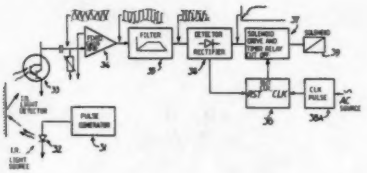
PCT No. PCT/AU84/00056, § 371 Date Dec. 13, 1984, § 102(e) Date Dec. 13, 1984, PCT Pub. No. WO84/04145, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 11, 1984, Ser. No. 690,194

Claims priority, application Australia, Apr. 13, 1983, PF8861; Aug. 30, 1983, PG1144

Int. Cl.[4] F16K *31/02*

U.S. Cl. 137—624.11 13 Claims



1. A sensing and valve operating means for remotely controlling a faucet, comprising:

(a) means to sense the presence of an object near a faucet outlet,

(b) means to energize a solenoid in response to the presence of the object,

(c) means to calculate the time when the solenoid is energized,

(d) means to remove the energy from the solenoid after a predetermined time interval, notwithstanding that the means to sense the presence of an object is sensing an object, and

(e) means for rendering inoperative said means to energize until after the object is removed from near the faucet outlet.

4,682,629

ELECTROMAGNETIC PROPORTIONAL VALVES

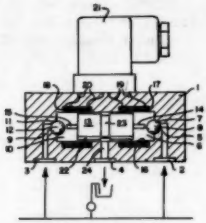
Horst Deininger, Horstein, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 712,192, Mar. 15, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 877,269

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409643

Int. Cl.[4] F15C 3/06

U.S. Cl. 137—625.4 2 Claims



1. An electromagnetic proportional valve comprising a housing, a bore in said housing, an inlet at each end of said bore, conduit means connecting each inlet to sources delivering fluid at constant flow rates, an exhaust outlet intermediate the ends of said bore, an electromagnetic coil adjacent each end and surrounding said bore, an armature in said bore movable longitudinally thereof, groove means on said armature communicating between said inlet and said outlet to equalize the pressure on opposite ends of the armature, valve means between said armature and each inlet, electrical proportional control means connected to each coil for selectively energizing said coils to move the armature to apply force against one or the other of said valve means at each inlet wherein flow will be restricted at the inlet of said one or the other valve means, thereby proportionally controlling pressure within the conduit means associated with the inlet being restricted.

4,682,630

HIGH PRESSURE NOZZLE DAM

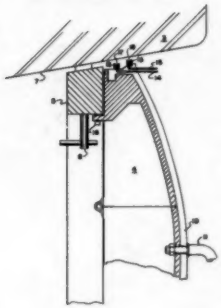
Glen E. Schukei, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 10, 1984, Ser. No. 639,564

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.[4] F16L 55/12

U.S. Cl. 138—89 4 Claims



1. A dam for mounting in an internally tapered surface of an adjacent conduit having a large diameter portion and a small diameter portion through which fluids flow, including:

a metallic ring positioned at the tapered surface on a plane at right angles to the axis of the conduit;

a dam structure formed of rigid hinged sections and including a dome positioned on the surface of the ring with the dome extending toward the large diameter portion of the tapered surface; and

a plurality of release screws spaced around the ring and extending beyond the outside diameter of the ring into engagement with the internally tapered surface of the conduit to maintain a space between the ring and the tapered surface to allow release and removal of the ring after the screws have been wedged into the surface of the conduit by extreme pressure on the dam.

4,682,631

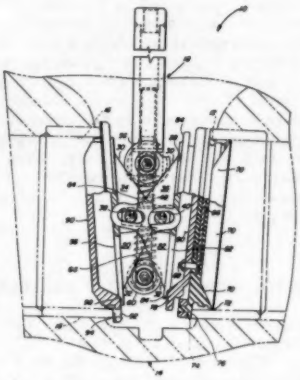
SEALING APPARATUS FOR A VALVE BODY OPENING

John F. Wilger, Honolulu; Stephen Orillo, Jr., Mililani Town, and Gregory S. Nakano, Pearl City, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1986, Ser. No. 848,422

Int. Cl.[4] F16L 55/12

U.S. Cl. 138—94 18 Claims



1. An apparatus for sealing the pressure side opening of a gate valve body comprising:

a pair of plates;

means joining the plates for lateral and pivotal movements with respect to one another;

each of the plates having an outside edge;

means associated with the outside edge of one of the plates for engaging the nonpressure side of the gate valve body;

means associated with the outside edge of the other plate for sealing the pressure side opening of the gate valve body;

each plate having a top camming surface and a bottom camming surface, the top camming surfaces of the plates being angled toward one another and the bottom camming surface of the plates being angled toward one another; and

means engaging the top and bottom camming surfaces of the plates for laterally spreading the plates,

whereby the sealing means can be forced into sealing engagement with the pressure side opening of the gate valve body.

4,682,632

CRACK STOPPING IN PIPELINES

Wolfgang Wiedenhoff, Muelheim; Adolf W. Gaertner, Neuss; Gert Vogt, Meerbusch, and Claus Weisgerber, Muelheim, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,829
Int. Cl.[4] F16L *9/04*
U.S. Cl. 138—178 5 Claims

1. A steel pipe to serve as crack stopper and to be inserted into a gas pipeline having respectively the same inner diameter the same outer diameter as the pipe, said pipe having front faces for butt welding to elements of the pipeline; the improvement comprising:

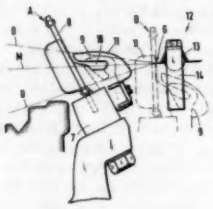
said pipe having outer or internal notches or texture changes arranged spaced apart along a plurality of helical lines, the notches or texture changes on any one of the helical lines being spaced apart on said one helical line, the helical lines having a pitch angle from 35 to 70 degrees to the axis, said notches or texture changes being arranged on these lines such that any hypothetical or geometrical axial line in a radial level of these notches or texture changes traverses at least one of the notches or texture changes which overlap accordingly as seen in an axial direction; said notches or texture changes individually being at least 10 but not more than 100 times longer than wide, and having rounded ends, further having a depth or radial dimension which is between about 1/10 and 3/5 of the wall thickness of the pipe.

4,682,633

DEVICE FOR SCREENING FLUFF FROM ENTERING A SHED

Franz Eisenlohr, Tuttwil, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 27, 1985, Ser. No. 814,190
Claims priority, application European Pat. Off., Feb. 5, 1985, 85 810042
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—1 C 14 Claims



1. In a weaving machine having a weft yarn entry zone for picking of a weft yarn into a shed, a device for screening out fluff in said entry zone, said device including

at least one screening plate having an opening for passage of a picked weft yarn therethrough;

at least one stationary cleaning element cooperable with said screening plate to screen fluff from entering said shed; and

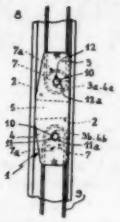
said screening plate being movable relative to said cleaning element to scrape fluff from between said plate and said element.

4,682,634

LIFTING BEAM FOR SHED FORMING DEVICE IN A WEAVING LOOM

Joseph Palau, Les Perris, FR-74410 Dungt, and Dario Bassi, 44 Rue des Treilles, FR69960 Corbas, both of France

Filed Aug. 14, 1986, Ser. No. 896,268
Claims priority, application France, Aug. 23, 1985, 85 12818
Int. Cl.[4] D03C *13/00*
U.S. Cl. 139—85 10 Claims



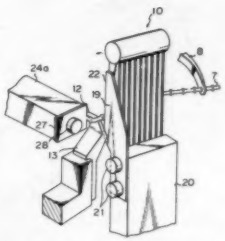
1. A lifting beam apparatus for the shed forming device in a weaving loom comprising a fork joint having oppositely oriented cheeks, openings through each of said cheeks, a pair of pulley means and having a web portion mounted to a central pivot pin means, said openings providing bearing means for selectively receiving one of said pivot pin means of said pulley means therein so that said pulley means are rotatably mounted in spaced relationship within said oppositely oriented cheeks, said cheeks having inner surfaces, said openings being surrounded on said inner surfaces of each cheek with a truncated boss having a central face which is co-axial with said openings, said web portion of each of said pulleys resting against said central face.

4,682,635

METHOD AND APPARATUS FOR MANUFACTURING WOVEN SLIDE FASTENER STRINGER

Masaatsu Ofusa, Toyama, and Toshio Ishihama, Osaka, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,376
Claims priority, application Japan, May 2, 1983, 58-78034
Int. Cl.[4] D03D *49/50*
U.S. Cl. 139—116 7 Claims



1. An apparatus for manufacturing a slide fastener stringer comprising a loom equipped with a reed for guiding the warp sheets and a first carrier for inserting a filling, characterized in that an arm having a hook for engaging a monofilament for

forming fastener elements is swingingly disposed on one side of the warp sheets between two defined positions, namely a first position at which the hook is situated substantially adjacent a fell and a second position at which the hook is situated remote from the fell, and in that there is disposed on the other side of the warp sheets in said loom a second carrier having a guide hole at a distal end thereof through which said monofilament for forming fastener elements is passed and confined from a source on said other side of the warp sheets, wherein the hook occupies said second position, said second carrier goes across the warp sheets and advances said monofilament to a position outside the hook to be engaged by said hook, said reed including a forming plate secured thereto for deforming said monofilament engaged by said hook into said fastener element, and a stringer guide at the downstream end of said fell for guiding the fastener stringer formed by said apparatus, said stringer guide having a support plate at the upstream end thereof for supporting a fastener element head portion when said monofilament is deformed into said fastener element, said support plate being oriented substantially at right angles to the direction in which said fastener stringer is guided.

4,682,636

METHOD AND DEVICE FOR PRODUCING A TEXTILE WEB BY PNEUMATIC WEFT PICKING OR INSERTION

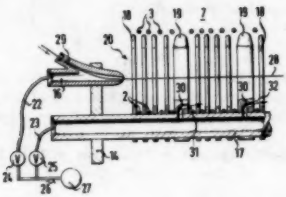
Josef Derichs, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 1, 1985, Ser. No. 761,612

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 3428387

Int. Cl.[4] D03D *47/30*

U.S. Cl. 139—435 **10 Claims**



1. Method of producing a textile web by pneumatic weft insertion which comprises generating a flow of hot air having a temperature of at least 45° C. and bringing a weft thread in contact with the flowing hot air during the insertion of the weft thread.

4,682,637

LINEAR WEAVING MACHINE

Wilbur J. Strohm, Jr., 2817 Via Segovia, Palos Verdes Estates, Calif. 90274

Filed Jul. 8, 1985, Ser. No. 752,652

Int. Cl.[4] B21F *27/02*

U.S. Cl. 140—9 **37 Claims**

18. An apparatus for making wire mesh fencing comprising:

a plurality of supply spools of strand wire located at a first stage;

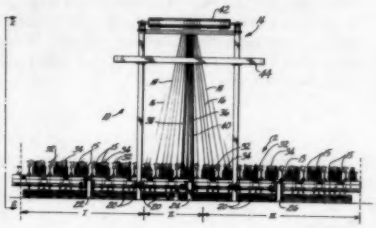
a plurality of strands of linearly aligned spools of wrap wires positioned above the supply spools with the longitudinal axis of each spool being vertically oriented;

a first shuttle and transfer means located at the first stage;

a plurality of receptacles for receiving each of the spools of wrap wires, said receptacles being mounted on the first shuttle and transfer means;

drive means for pulling the strand wires upwardly through the first stage to a second weaving stage and for pulling the wrap wires from the interior of the wrap wire spools upwardly from the first stage to the second stage;

a second shuttle and transfer means located at the second weaving stage which moves in synchronism with the first shuttle and transfer mechanism whereby the wrap-wire spools may be moved back and forth along the line of alignment in a weaving pattern about the strand wires on



the first shuttle and transfer mechanism with the second shuttle and transfer mechanism to cause the individual wrap wires to be interwoven and wrapped around the individual strand wires, creating a predetermined geometric-shaped pattern of fencing.

4,682,638

STUMP-EXTRACTING TOOL

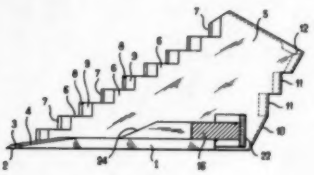
André Becker, 54 rue Saint Vincent, Bulligny, 54170 Colombey Les Belles, France

Filed Apr. 9, 1985, Ser. No. 721,845

Claims priority, application France, Apr. 13, 1984, 84 05900

Int. Cl.[4] A01G *23/08*

U.S. Cl. 144—2 N **11 Claims**



1. A stump-extracting tool comprising a flat spur (1) of substantial length having a forward cutting edge (2) at one end and a cutter-blade (5) transverse to the plane of the spur (1), the cutter-blade (5) being provided with a series of stair-step teeth (6) having each respectively a forward cutting edge (7) perpendicular to the plane of the spur (1).

4,682,639

APPARATUS FOR CUTTING VENEER PIECES INTO EQUAL SECTIONS

Shigeki Takeda, Tokyo, and Sachio Maekawa, Okazaki, both of Japan, assignors to Hashimoto Denki Co., Ltd., Takahama, Japan

Filed Dec. 20, 1985, Ser. No. 811,751

Claims priority, application Japan, Aug. 26, 1985, 60-187050

Int. Cl.[4] B27B *1/00*

U.S. Cl. 144—2 R **9 Claims**

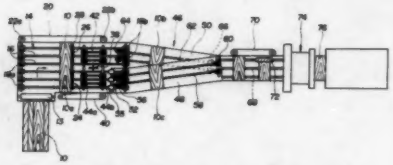
1. An apparatus for cutting into equal sections a veneer piece having a longitudinal dimension in a direction of fibers thereof and having at one of the shorter edges thereof an irregular surface, said apparatus comprising:

a main conveyer arranged for feeding the veneer piece in a feed direction transverse to the longitudinal dimension thereof;

means for forwarding the veneer piece along the longitudi-

nal dimension thereof from a mass of veneer pieces onto said main conveyer;

a straightening unit for controlling the orientation of the veneer piece on said main conveyer in such a manner that the fibers and the longitudinal dimension of the veneer piece precisely extend transverse to said feed direction of said main conveyer, said straightening unit including a plurality of retractable stoppers capable of projecting from said main conveyer to stop the veneer piece for a predetermined time;



a pair of guide belts extending along opposite sides of said main conveyer for preventing a change of the orientation of the veneer piece straightened by said straightening unit;

a cutter disposed in said main conveyer at a position downstream of said straightening unit, said cutter being so arranged as to cut the veneer piece into sections along said feed direction thereof; and

a multiple conveyer system to transport the sections of the cut veneer piece at different points in time to a single feeder for conveying the sections to means for forming seam plates.

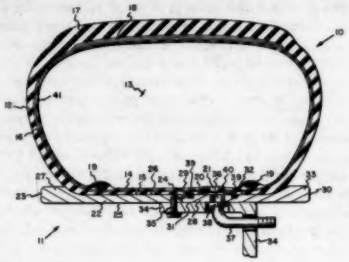
4,682,640

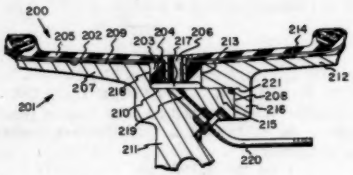
CIRCUMFERENTIAL CONDUIT MEANS FOR INFLATING A CLOSED TORUS TIRE

Robert E. Berger, North Canton; Richard L. Crossman, and William F. Conley, both of Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 21, 1982, Ser. No. 390,108
Int. Cl.[4] B60C *5/00*
U.S. Cl. 152—405 **10 Claims**

1. A closed torus tire comprising: a carcass defining a closed inflation chamber, said carcass having an annular base region with a radially inner mounting surface having a rib extending radially inwardly therefrom and circumferentially thereabout, a plurality of axially spaced apart roll-restraining hoops adjoining said annular base region, said rib having a radially inner circumferential surface; said annular base region and said rib having an air inlet passageway therethrough communicating





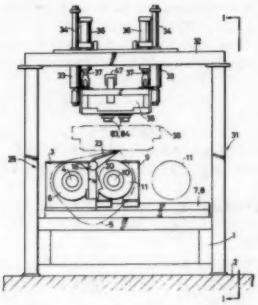
with said closed inflation chamber and the radially inner circumferential surface of said rib.

4,682,641

SYSTEM FOR MANUFACTURE OF HIGH-LUG TIRES

Tadashi Watanabe, and Shunichi Inoue, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,513
Claims priority, application Japan, Apr. 9, 1984, 59-70531
Int. Cl.[4] B29D *30/68*
U.S. Cl.-157—13 **7 Claims**



1. An apparatus for manufacturing a high-lug tire, comprising: support means for supporting an unvulcanized tire from inside thereof and for moving said unvulcanized tire in a circumferential direction; a cutter assembly for partially cutting off the tread of the unvulcanized tire; and dirve means for moving said cutter assembly to form a quasi pattern of grooves in said tread which are in substantially complementary relation to the shaping surface of a vulcanizing mold, wherein said support means comprises a pair of rotatable parallel rollers inserted in the unvulcanized tire parallel to an axis thereof; a

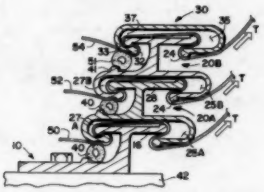
shifter mechanism for moving said rollers with respect to each other; and a substantially flat support plate arranged for surface-to-surface contact with an inner surface of a flat portion of the unvulcanized tire when it is tensioned between said rollers as they are moved apart from each other.

4,682,642

FASTENER FOR PLASTIC FILM SHEETING

Rodney C. Hogsbead, III, 1331 Carlton St., Longwood, Fla. 32750, and Giles Van Duyne, Jr., 3042 Holliday Ave., Apopka, Fla. 32703

Filed Dec. 9, 1985, Ser. No. 806,391
Int. Cl.[4] A47H *13/00*
U.S. Cl. 160—392 **14 Claims**



1. A device for fastening a flexible sheet to a structure comprising:

a base member having means for attachment to a structure, said base member having an elongated rigid base portion and a T-shaped portion integral with said base portion in which a planar T-crossbar portion is essentially parallel with said base portion, said T-crossbar portion having a long section and a short section thereof; and

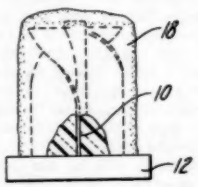
A cap member having an elongated planar surface, a first longitudinal edge of said planar surface having a first 180° lip defining a first channel, the depth of said first channel essentially that of the length of said long section of said T-crossbar portion and a second 180° lip defining a second channel having a depth essentially that of the length of said short section of said T-crossbar portion, said cap member adapted to be disposed with said long section of said T-crossbar portion within said first channel and said short section of said T-crossbar portion within said second channel with a flexible sheet captivated therebetween.

4,682,643

METHOD OF PRODUCING MOLDED PARTS AND CASTING PATTERN THEREFOR

David L. Bernhardt, Canton, Mich., and Neno T. Nenov, Williamsville, N.Y., assignors to Nu Con Corporation, Livonia, Mich.

Continuation-in-part of Ser. No. 543,775, Oct. 20, 1983, abandoned. This application Oct. 3, 1985, Ser. No. 783,761
Int. Cl.[4] B22C *9/04*
U.S. Cl. 164—34 **8 Claims**



1. A method of making a plurality of identical molded parts, comprising the steps of:

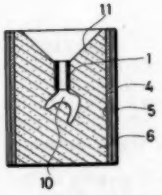
(a) forming a first plastic pattern corresponding to the shape and dimensions of said parts;
(b) encasing said first pattern in a first mold;
(c) removing said first pattern from said first mold to provide a mold cavity;
(d) charging said first mold with a quantity of flowable material which sets up to form a resilient, pliable second pattern;
(e) separating said second pattern from said first mold;
(f) forming a second mold by casting material around said second pattern;
(g) removing said second pattern from said second mold;
(h) charging said second mold with a quantity of molding material;
(i) breaking said second mold to remove the part molded therewithin; and
(j) then, repeating Steps (f) through (i) to produce additional parts.

4,682,644

MOLD FOR USE IN DENTAL PRECISION CASTING

Masato Ueno, Hiroshima, Japan, assignor to Kyocera Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 6, 1983, Ser. No. 558,496
Claims priority, application Japan, Dec. 6, 1982, 57-214372; Jun. 28, 1983, 58-117723
Int. Cl.[4] B22C *9/04, 9/08*
U.S. Cl. 164—359 **31 Claims**



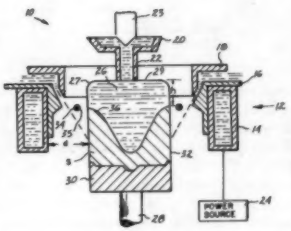
1. A mold for use in dental precision casting, said mold comprising a sprue and a dental precision casting mold investment, said investment containing a closed ended cavity in flow communication with said sprue, said sprue comprising a heat resisting ceramic tubular body.

4,682,645

CONTROL SYSTEM FOR ELECTROMAGNETIC CASTING OF METALS

Peter J. Kindlmann, Guilford, and Brian G. Lewis, Branford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 3, 1986, Ser. No. 835,848
Int. Cl.[4] B22D *27/02, 11/18*
U.S. Cl. 164—453 **32 Claims**



1. An apparatus including:

means for electromagnetically containing a head of molten material and for forming said molten material into a solid product having a desired shape;

said solid product emerging from said containing and forming means in a desired casting direction;

a boundary between said molten material head and said solid product comprising a liquid-solid interface;

said head of molten material having a height comprising a distance measured in said casting direction along an outer surface of said molten material head from said liquid-solid interface to an upstream surface of said molten material;

said containing and forming means comprising a containment inductor and means for applying a current and a voltage to said inductor to thereby generate and apply a magnetic field to contain said molten material and to form said molten material into said desired shape;

a sense loop positioned between an inner surface of said inductor and an outer surface of at least one of said molten material head and said solid product in a plane substantially transverse to said casting direction; and

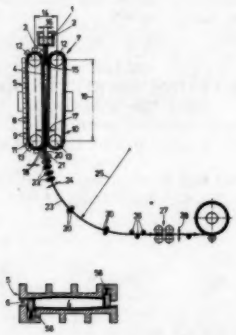
said sense loop being positioned along an axis parallel to said casting direction at a location in the range of from about a point substantially equal to said height of said molten metal head downstream of said liquid-solid interface to a point substantially equal to about one-half of said height of said molten metal head upstream of said interface.

4,682,646

CONTINUOUS CASTING MOLD FOR SELECTIVELY CASTING STRANDS OF DIFFERENT WIDTHS AND THICKNESSES AND A METHOD FOR OPERATING THE CONTINUOUS CASTING MOLD

Anton Hulek, Linz, Austria, assignor to Voest-Alpine, Linz, Austria

Filed Aug. 29, 1985, Ser. No. 770,847
Claims priority, application Austria, Sep. 10, 1984, 2892/84
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—481 **23 Claims**



1. A continuous casting mold for selectively casting strands of different widths and thicknesses, comprising two first plate-shaped sidewalls having facing surfaces arranged opposite each other and defining a mold cavity at two opposite sides, each of said two first sidewalls having a recess at a single side edge of said first sidewalls' respective facing surface,

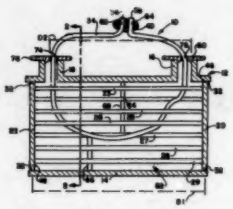
two second sidewalls each having a rear face and each of said second sidewalls being arranged so as to be sunk in one of said recesses with said second sidewalls' respective rear face bearing in a respective first sidewall said sidewalls, the second sidewalls having front faces pressable against and in facing relationship to the facing surface of said first sidewalls so as to form a peripherally closed mold cavity.

4,682,647

INDICATOR DEVICE FOR A HEAT EXCHANGER

Robert Sleep, 4304 Autumn Leaves Dr., Tampa, Fla. 33624

Filed Feb. 7, 1986, Ser. No. 827,258
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—11.1 **23 Claims**



1. An indicator device for a heat exchanger for indicating that the heat exchanger has been disassembled, cleaned, inspected, reconditioned and subsequently rebrazed, said device comprising in combination:

an elongate housing, defining an inlet and an outlet port;

a first and a second tube plate with said plates being spaced axially within said housing;

a plurality of heat exchanger tubes extending through and between said plates;

first sealing means disposed between said plates and said tubes for sealing said tubes relative to said plates;

second sealing means disposed between said tube plates and said housing for sealing said tube plates within said housing;

an elongate flexible means having a first and second end with said first end of said flexible means being threaded into one of said inlet and said outlet ports and extending around at least one of said tubes and being threaded out of one of said inlet and said outlet ports; and

an indicator means extending around said first end and said second ends of said flexible means for sealingly connecting together said end of said flexible means for indicating that the heat exchanger has been disassembled, cleaned, inspected, reconditioned and subsequently reassembled and rebrazed.

4,682,648

TEMPERATURE OFFSET CONTROL SYSTEM

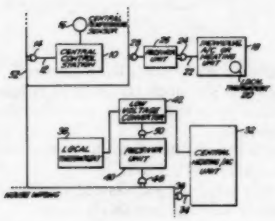
Morton Fried, 706 Bolton Rd., Far Rockaway, N.Y. 11691

Filed Dec. 29, 1982, Ser. No. 454,428
Int. Cl.[4] G05D *23/00*; **F24F** *11/00*
U.S. Cl. 165—12 **14 Claims**

1. A temperature offset control system for controlling the operation of both heating and air conditioning systems simultaneously contained within the same premises each of which is set by local thermostats to operate at an appropriate temperature, said offset control system comprising:

a central control station having means for presetting an offset temperature range, means for sensing the temperature at a central location, means for comparing the sensed temperature with the offset temperature range, means responsive to the comparison for producing a control signal indicative of whether the sensed temperature is within said offset temperature range or beyond said offset temperature range, and means for transmitting said control signal onto the standard energy lines servicing the premises; and

a receiving station respectively associated with each heating and air conditioning system, said receiving stations each comprising means for receiving the same transmitted control signal from the energy lines, and switch means for controlling the energization of the respective system in response to the received control signal, wherein said heating systems and associated local thermostat are disabled by said control signal when said control signal originates from a sensed temperature above the lower end of the offset temperature range, and said air conditioning systems and associated thermostats are disabled by the same control signal when said control signal originates from a sensed temperature below the upper end of the offset temperature range;



wherein said central control station comprises control switching means having an ON mode for producing a turn ON signal, and OFF mode for producing a turn OFF signal and an OFFSET mode for producing said control signal responsive to the particular output of the comparing means, and timer means permitting automatic timed switching between any two of said three modes, and further comprising means for checking the previous signal sent and only sending a signal entered on said central control station changing a previous signal sent.

4,682,649

AUXILIARY AIR CONDITIONING, HEATING AND ENGINE WARMING SYSTEM FOR TRUCKS

J. Rex Greer, 4404 18th St., Lubbock, Tex. 79416

Filed Jun. 2, 1986, Ser. No. 869,607
Int. Cl.[4] F02N *17/06*; B60H *1/32*
U.S. Cl. 165—43 **17 Claims**

1. An air conditioning, heating and engine warming system for trucks and like vehicles comprising:

an engine including a block connected to a radiator;

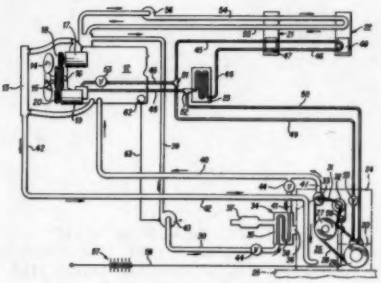
an engine and truck air conditioning and heating system including a truck compressor, a condenser, refrigerant lines extending from the truck compressor to at least one air conditioning unit and extending from the air conditioning unit to the condenser and back to the truck compressor, and heater conduits extending from the engine block to at least one heating unit and extending back to the engine block;

an auxiliary power plant on the truck including an auxiliary engine, alternator, coolant system including a water pump and an air conditioning compressor each driven by the auxiliary engine, and a heat exchanger having a chamber located immediately adjacent the auxiliary engine for receiving hot exhaust gases therefrom and having a liquid heating coil within said chamber in heat transfer relationship with the exhaust gases,

a first coolant conduit coupled from the engine block to one side of the heating coil of the heat exchanger and a second coolant conduit coupled directly back to the engine block, said second coolant conduit being additionally coupled to the other side of said heating coil,

a circulating pump connected in the first conduit between the engine block and the heating coil;

the return of heated water to the engine block from said second conduit acting to warm the engine block and thus aid starting of the truck engine in cold weather when the auxiliary power plant is operated;



additional refrigerant lines coupling the compressor of the auxiliary power plant to refrigerant lines connecting said air conditioning unit and said condenser whereby refrigerant can be independently supplied to the truck air conditioning system from the compressor of the auxiliary power plant when said auxiliary power plant is operated; and

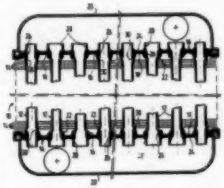
means in the refrigerant lines between the truck compressor and said one air conditioning unit and between the compressor of the auxiliary power plant and said one air conditioning unit for restricting back flow of refrigerant between the two said compressors.

4,682,650

HEAT EXCHANGER OF THE TUBE BANK TYPE, IN PARTICULAR FOR AN AUTOMOTIVE VEHICLE

Michel Potier, Rambouillet, France, assignor to Valeo, Paris, France

Filed Sep. 11, 1985, Ser. No. 774,996
Claims priority, application France, Sep. 25, 1984, 84 14723
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—173 **8 Claims**



1. A tube-bank heat exchanger, in particular for an automotive vehicle, including a pair of headers with multiple tubes therebetween, said tubes having substantially coextensive first ends and substantially coextensive second ends, said headers having multiple holes defined therethrough, the first and second tube ends being received through and extending beyond the corresponding headers and being mounted in a fluid-tight manner in the holes of the headers, the first and second ends of each tube being substantially identical, selected ones of said

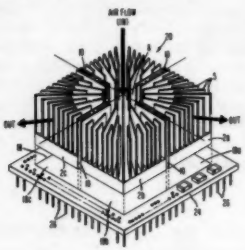
tubes having their tube ends outwardly enlarged solely beyond the corresponding headers and defining abutment shoulders retaining the selected tubes within the holes of the headers against outward withdrawal of the headers therefrom, the remainder of said tubes being outwardly enlarged solely inward of the hole-received ends thereof and inward of the corresponding headers to define bulges retaining the headers against inward movement of said headers relative to the tubes, said bulges and said abutment shoulders being located immediately adjacent the opposed sides of the corresponding headers and preventing any displacement of said headers with respect to said tubes.

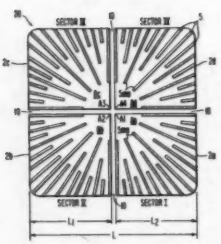
4,682,651

SEGMENTED HEAT SINK DEVICE

Paul G. Gabuzda, Laguna Beach, Calif., assignor to Burroughs Corporation (now Unisys Corporation), Detroit, Mich.

Filed Sep. 8, 1986, Ser. No. 904,442
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—80.3 **11 Claims**





10. A heat sink having a four sector configuration of four duplicate square baseplate units each placed in close non-touching juxtaposition to form a central orifice area for diverting air flow across radially oriented fins outward past the periphery of each sector, the combination comprising:

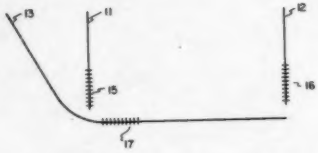
(a) said four duplicate square baseplate units holding vertical fin elements of variable length to form said four sectors and wherein the inner apex of each sector includes an area devoid of fins to form said central orifice area.

4,682,652

PRODUCING HYDROCARBONS THROUGH SUCCESSIVELY PERFORATED INTERVALS OF A HORIZONTAL WELL BETWEEN TWO VERTICAL WELLS

Wann-Sheng Huang, and Margaret A. Hight, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,393
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—263 **12 Claims**



1. A method for producing hydrocarbons from a portion of an underground formation bounded by at least two substantially vertical wells and at least one substantially horizontal well, comprising:

injecting a thermal fluid into the formation through a first substantially vertical well;

producing fluids from a substantially horizontal well located within the underground formation,

said horizontal well extending from an area near the first vertical well to the vicinity of a second substantially vertical well penetrating the formation,

said horizontal well produced fluids only being produced from a first perforated interval in the horizontal well in the vicinity of the first vertical well;

ceasing production from the first perforated interval of the horizontal well and producing fluids from a second perforated interval of the horizontal well which is farther from the first vertical well than the first perforated interval;

continuing to move the production of fluids through the horizontal well to perforated intervals successively farther away from the first vertical well than the preceding production perforated intervals;

after fluids have been produced through a perforated interval in the vicinity of the second vertical well, producing fluids through the second vertical well.

4,682,653

STEAM RECOVERY PROCESSES EMPLOYING STABLE FORMS OF ALKYLAROMATIC SULFONATES

Howard P. Angstadt, Media, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 782,158, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 596,476, Apr. 3, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,185
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—303 **5 Claims**

1. A method for the recovery of oil from a subterranean reservoir which comprises injecting steam and a dialkylaromatic sulfonate surfactant into the reservoir, and producing oil displaced by said surfactant and steam, said surfactant being comprised of a mixture of para- and meta-isomers of said dialkylaromatic sulfonate, wherein the amount by weight of the para-isomer in the mixture has been increased relative to the amount of meta-isomer sufficient to provide an increase in the hydrolytic stability of said mixture.

4,682,654

ENZYMATICALLY-TREATED GUAR GUMS

Walter H. Carter, and Vinai K. Srivastava, both of Dalton, Ga., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Division of Ser. No. 736,667, May 22, 1985. This application Oct. 9, 1986, Ser. No. 917,032

Int. Cl.[4] E21B *43/26*

U.S. Cl. 166—308 1 Claim

1. In a method of recovering oil from an oil bearing formation by fracturing thereof, the step of inserting into said formation, at high pressure, an aqueous composition comprising guar gum in water, the guar gum having been first coated and impregnated, while in the solid particulate state, with an aqueous solution of a hydrolytic enzyme.

4,682,655

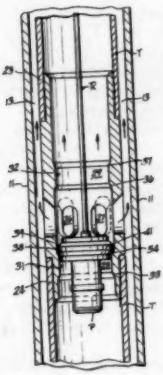
SLOTTED HOUSING HAVING MULTIPLE SEATS FOR SUPPORTING AND LOCATING SUBMERSIBLE PUMPS IN DEEP WELLS

Olegario Rivas, San Antonio, Venezuela, assignor to Intevep, S.A., Caracas, Venezuela

Filed Sep. 22, 1986, Ser. No. 910,016

Int. Cl.[4] E21B *43/12*

U.S. Cl. 166—369 6 Claims



1. In a fluid product pumping system for deep fluid well formations including a well casing surrounding fluid product tubing string to define an annular space between the casing and the tubing string,

a method of creating a valve action in the tubing string comprising the steps of:

forming at least one through aperture in the product tubing string,

lowering the tubing string into the well until the aperture reaches the region of the surface of the fluid to be pumped,

sealing a lower region of said annular space to isolate the formation,

supporting a submersible pump having a housing on a rod string within the product tubing string in a pumping relationship with said fluid, and utilizing the pump housing in cooperation with said tubing string to control fluid flow of product from said pump through said aperture by selectively positioning said pump housing above and below said aperature such that when the pump housing is below the aperature the product flows through the tubing string and through the annular space simultaneously and when the pump housing is above the aperature the product flows solely through said tubing string.

5. A fluid product pumping system for fluid wells comprising:

a well casing;

a fluid production tubing string within the casing spaced from the casing to define an annular space between the casing and the tubing string;

a slotted housing in series with and forming a part of the tubing string, said slotted housing defining a hollow cylindrical body having at least one aperture leading from the interior of the tubing string to the annular space, said body having on the interior surface thereof a first seat means below said at least one aperture, a second seat means above said at least one aperture and a third seat means above said second seat means;

a submersible pump supported movably within said body; and

rod means for moving said pump relative to said aperture for selectively positioning said pump on said first seat means and said second seat means to effect a valving action wherein the product flows through said annular space when said pump is on said first seat means and said product flows through said tubing string when said pump is positioned on said second seat means.

4,682,656

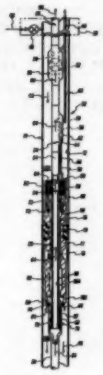
COMPLETION APPARATUS AND METHOD FOR GAS LIFT PRODUCTION

Fleming A. Waters, Coppell, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 20, 1986, Ser. No. 876,700

Int. Cl.[4] E21B *23/02, 33/119, 34/10, 43/12*

U.S. Cl. 166—372 9 Claims



1. Well completion apparatus comprising, in combination:

a well packer comprising a mandrel, anchoring and sealing means for anchoring said mandrel in a well casing and sealing therebetween, said mandrel having a longitudinal bore communicating witht he casing annulus above the packer and below the packer;

a production seal unit having an annular coupling collar disposed for sealing engagement against the packer mandrel bore and a production stinger conduit for insertion into said packer mandrel bore, said stinger conduit having a bore defining a flow passage for formation fluid produced from said well, the annulus between the production stinger conduit and the packer bore defining an annular flow passage for conduit lift gas from the upper casing annulus into the lower casing annulus; and,

said production seal unit including a coupling head having a production flow passage and a lift gas flow passage, said annular coupling collar being mounted onto said coupling head for insertion into the packer mandrel bore, said coupling collar carrying an annular seal for sealing the casing upper annulus with respect to the packer mandrel bore.

9. A method for producing a gas-lift well of the type having a casing and a well packer anchored in said casing comprising the steps:

running a string of production tubing including a stinger conduit into said well with said production stinger conduit extending through a flow passage bore in said packer, the bore of said stinger conduit defining a flow passage for conducting formation fluid through said packer, and the annulus between said packer bore and said stinger conduit defining an annular flow passage for conducting lift gas from the well casing annulus above the packer into the well casing annulus below the packer;

pressurizing the well casing annulus above the packer with lift gas;

discharging pressurized lift gas from the well casing annulus above the packer through a surface controllable safety valve into the annulus between the production stinger conduit and the packer bore;

conducting lift gas through said packer annulus and discharging it into the lower casing annulus;

discharging lift gas from the lower casing annulus into the production tubing through a gas lift valve attached to the production tubing at a location below the fluid level of the well; and,

conducting formation fluid from said well through said production stinger conduit.

4,682,657

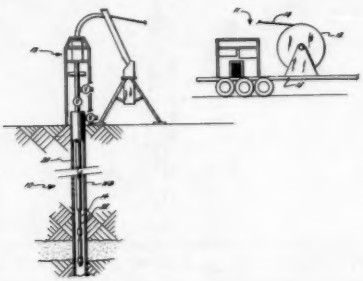
METHOD AND APPARATUS FOR THE RUNNING AND PULLING OF WIRE-LINE TOOLS AND THE LIKE IN AN OIL OR GAS WELL

James B. Crawford, P.O. Box 30636, Lafayette, La. 70503

Division of Ser. No. 701,572, Feb. 14, 1985, Pat. No. 4,612,984. This application Sep. 22, 1986, Ser. No. 910,418

Int. Cl.[4] F21B *17/20*

U.S. Cl. 166—385 **7 Claims**



1. A method for running tools in an oil or gas well on coil tubing, comprising:

a. running an elongated small diameter tubing string with an unobstructed open flow bore from a coil stored on a reel down an oil/gas well forming a work string;

b. securing as fluid conveying tool carrier to the distal end of the coil tubing string so that fluid can circulate from the coil tubing on the reel through the unobstructed open flow bore and into the tool carrier;

c. introducing pressurized gas into the well through the unobstructed open flow bore of the tubing so that it circulates through the tubing and then the tool carrier; and

d. supporting a tool assembly with the tool carrier so that tension in the excess of 14,000 lbs. can be applied to the tool assembly with the coil tubing work string for operating a tool supported by the tool carrier using pressure applied to the tool assembly and tool carrier with the tubing work string.

4,682,658

TILLING APPARATUS FOR PREPARING A RIDGE AND FURROWED FIELD

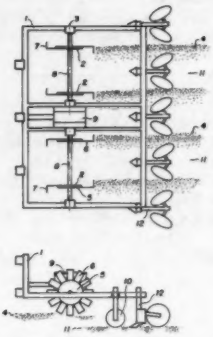
Ward W. Erickson, 55 Boundary Street, Moree New South Wales, 2400, Australia

Filed Sep. 13, 1985, Ser. No. 775,611

Claims priority, application Australia, Sep. 17, 1984, PG7166

Int. Cl.[4] A01B *33/02, 49/02*

U.S. Cl. 172—73 **13 Claims**



1. A tilling apparatus for preparing a ridge and furrowed field for planting with each ridge having a top and each furrow a bottom, said apparatus comprising:

a frame adapted to be drawn in a given direction by a tractor;

a plurality of laterally spaced apart driven hoeing means mounted on said frame to rotate in a direction opposing the drawing direction of the apparatus about an axis substantially normal to said drawing direction;

each of said hoeing means being adapted to be aligned with a ridge line over which the frame is to be drawn;

the hoeing means having a bottom of rotation adapted to be positioned so as to be higher than the furrow bottom;

a plurality of lister means mounted to said frame aft of said hoeing means;

each of said lister means being spaced laterally from each of said hoeing means, such that one of said lister means is adapted to be aligned with each furrow, and centered between adjacent ridges, over which the frame is to be drawn, when said hoeing means are each aligned with a ridge line; and

said lister means and said hoeing means being displaced vertically relative to each other with the lister means having a bottom lower than the lowest position of the hoeing means bottom of rotation whereby the hoeing means is adapted to remove the tops or crests of said ridges and any vegetation growing therein and said lister means is adapted to reach the bottom of said furrows to thereby reform the ridge and furrowed field by clearing the furrows and reforming the tops of the ridges with soil displaced from the furrows.

4,682,659

GROUND PIERCING ATTACHMENT FOR TRACTORS

Weikko R. Holopainen, R.F.D. #1, Box 69A, Mohawk Trail, Shelburne, Mass. 01370

Continuation-in-part of Ser. No. 614,471, May 25, 1984, abandoned. This application Apr. 29, 1986, Ser. No. 857,073

Int. Cl.[4] E21B *7/26*

U.S. Cl. 175—19 **9 Claims**

8. Ground piercing attachment for a tractor having a material handling bucket which is mounted on the tractor for move-

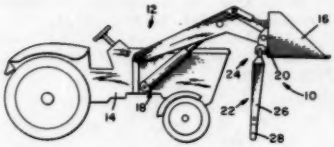
ment relative to the tractor, said bucket having a rear surface, said attachment comprising:

(a) a bracket which is fixed to the lower portion of the rear surface of the bucket of a tractor,

(b) an elongated bar,

(c) a ring which is fixed to the top end of the bar, and

(d) a horizontal support fixed to said bracket and extending freely through said ring, so that the axis of said ring is



parallel with the front to back axis of the tractor, so that said bar is suspended from said support element and pivoted about said axis, whereby when the bucket is raised to a sufficient height so that the bottom end of the bar is positioned above the ground, and whereby subsequent lowering of the bucket causes the bar to be driven into the ground to form a posthole upon removal of the bar from the ground.

4,682,660

HYDRO-DRILL WITH CIRCULAR IMPRESSION

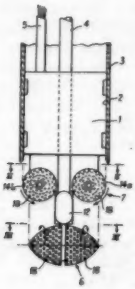
Hervé Barthelemy, La Celle Saint Cloud, and Yves Legendre, Balloy, both of France, assignors to Soletanche, Nanterre, France

Filed Dec. 12, 1985, Ser. No. 808,311

Claims priority, application France, Dec. 13, 1984, 84 19053

Int. Cl.[4] E21B *10/26*

U.S. Cl. 175—96 **10 Claims**



1. A device for producing generally circular boreholes in the ground comprising

a body having an upper and lower pair of bits,

a driving means for driving each bit in said pairs of bits in a direction opposite to the direction of rotation of the other bit in said pair

said bits having a means for breaking up the soil and wherein

said lower pair of bits is capable of rotating in opposite directions by said driving means around two parallel horizontal axes, each of said lower pair of bits having the external shape of a volume of revolution the generatrix of which consists of a circular arc corresponding to the circular cross section of the borehole and wherein

said upper pair of bits are above said lower pair of bits and rotate in opposite directions about two parallel horizontal axes which parallel axes are not parallel the axes of said lower pair of bits, each of said upper pair of bits having the external shape of a volume of revolution the generatrix of which consists of a circular arc corresponding to the circular cross-section of the borehole.

4,682,661

DRILLING APPARATUS

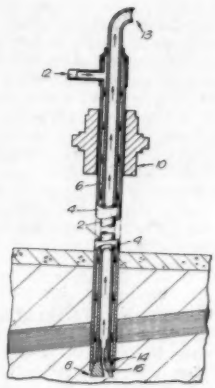
Philip M. Hughes, 31 Marlborough Drive, Tytherington, Macclesfield, Cheshire, and Michael W. McHugh, 3 Sulby Road, Thorplands, Northampton, both of Great Britain

Filed Mar. 29, 1984, Ser. No. 594,562

Claims priority, application United Kingdom, Mar. 31, 1983, 8309016

Int. Cl.[4] E21B *17/18, 21/10, 21/12*

U.S. Cl. 175—215 **8 Claims**



1. A boring head for duo-pipe drilling apparatus of the type comprising concentric inner and outer pipes defining an annular passage therebetween for transmitting pressurised fluid to the boring head, the boring head comprising;

a body having a coupling end and a cutting end;

a passage for material return extending through the body from the cutting end to the coupling end, said passage having an inlet at the cutting end displaced relative to the intended axis of rotation of the boring head and extending radially across substantially the full radius of the boring head, and an exit at the coupling end which is coaxial with the intended axis of rotation of the boring head;

means at the cutting end comprising at least one cutting tooth having an elongate attacking edge substantially perpendicular to said axis and overlying said inlet, said tooth having a forward portion bevelled rearwardly from said edge for mechanically displaying material cut by said at least one cutting tooth into said inlet as said boring head is rotated;

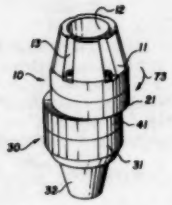
fluid supply galleries in said body opening into said passage for material return for directing fluid towards the exit of said passage to flush cut material in said passage to the exit;

the coupling end of the boring head being adapted for connection to a duo-pipe system such that the annular passage for pressurised fluid of the duo-pipe system is in communication with the fluid supply galleries and the inner pipe of the duo-pipe system is in communication with the exit of the passage for material return.

4,682,662
DRILL ADAPTER

Vladimir Vancura, Brudsporregränd 6, S-162 45 Vällingby, Sweden

Filed Apr. 25, 1985, Ser. No. 727,224
Int. Cl.[4] E21B *10/26, 17/00*
U.S. Cl. 175—320 4 Claims

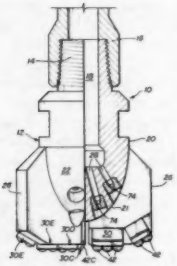


1. A soil and rock drill adapter for connection between a rotatable drill rod and drill bit such as to enable the drill bit to be positioned eccentrically in relation to the longitudinal axis of the drill rod, said adapter comprising two mutually connected parts arranged one above the other and abutting each other in a plane extending at right angles to the longitudinal axis of the drill rod and provided with means which enable mutual adjustment of said adapter parts between an eccentric position and a centric position relative to said axis and wherein each of said adapter parts includes an end piece and a journal plate, and wherein the journal plates are pivotally connected together by means of a pivot means and pivot-restricting means, and are firmly connected to associated end pieces by means of screw fastener means.

4,682,663
MOUNTING MEANS FOR CUTTING ELEMENTS IN DRAG TYPE ROTARY DRILL BIT

Jeffery E. Daly, Cypress, and Percy W. Schumacher, Houston, both of Tex., assignors to Reed Tool Company, Houston, Tex.

Filed Feb. 18, 1986, Ser. No. 830,399
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 13 Claims



1. In a drag type rotary drill bit having a bit body defining an exterior face;

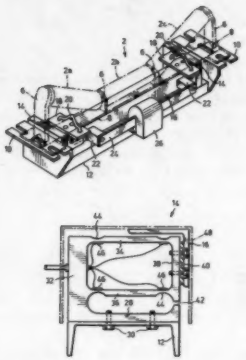
at least one unitary integral hard metal holder secured directly to said bit body, said holder being elongate and having a projecting end portion extending from said face of the bit body; and

a plurality of polycrystalline diamond compact cutting elements mounted directly on the projecting end portion of said holder, each cutting element having a cutting edge projecting from said holder for engaging in cutting relation, a formation to be cut, each of the cutting edges of the plurality of cutting elements for said holder being in a cutting plane extending generally radially of the axis of rotation of the bit, said holder providing reinforcement and rigidity to said cutting elements in resisting stresses resulting from the cutting operation.

4,682,664
LOAD SENSING SYSTEMS FOR CONVEYOR WEIGH SCALES

Charles W. Kemp, Arlington, Tex., assignor to Canadian Corporate Management Co., Ltd., Toronto, Canada

Filed Jul. 31, 1985, Ser. No. 761,173
Int. Cl.[4] G01G *11/14, 3/08;* G01L *25/00*
U.S. Cl. 177—16 12 Claims



1. A conveyor belt weighbridge comprising support means for supporting a section of a conveyor belt run, said support means extending transversely of a line of travel of said run, a frame member extending transversely relative to the conveyor belt run for supporting the weighbridge in a fixed relationship to said line of travel, and transversely spaced cantilever strain gauge bridge units between the frame member and opposite ends of the support means, said units being responsive to vertical components of forces applied thereto by the support means, said units providing the sole support for said support means, the support means being supported by the units vertically above the frame member.

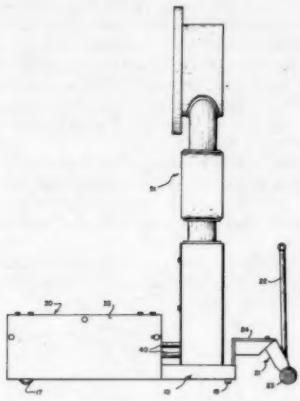
4,682,665
PORTABLE LOW PROFILE MECHANICAL SCALES

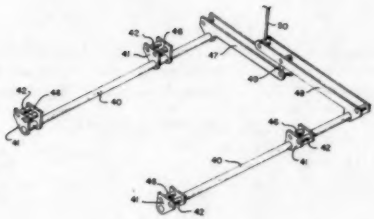
Brad J. Young, 48 Fort Clark Estates, Benwood, W. Va. 26031

Filed Aug. 20, 1986, Ser. No. 898,329
Int. Cl.[4] G01G *19/08, 21/08*
U.S. Cl. 177—139 6 Claims

1. A portable low profile mechanical scale comprising a carriage having a pair of spaced apart side frame members, each having wheel means at one end and ground support means adjacent the other end, spacer means extending between said side frame members substantially at ground level holding said side frame members in spaced apart parallel relation, wheeled lift means at said other ends of the side frame member for lifting said other ends to raise the ground support means, a pair of torsion bars above said side members at two different parallel levels, one adjacent each side frame and supported theron by triangular link means fixed to the torsion bars at one end and supported on the side members at the other, weigh bed means movable vertically between said side frame members and pivoted to said link members between the torsion bar and support on the side frame members, lever means on each torsion bar adjacent said wheel lift means extending transversely

toward each other, one above the other, link means connecting said lever means midway between said side frame members and





connector means on the end of the lever above the other for connection to a weight indicating mechanism.

4,682,666

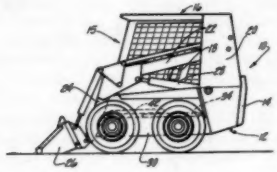
OPERATOR COMPARTMENT ASSEMBLY

Maurice Klee, Burlington, Iowa; Robert T. Peterson, Gladstone, Ill.; Gary L. Cochran, Burlington, Iowa; James E. Dawson, Burlington, Iowa, and Robert M. Anderson, Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 31, 1984, Ser. No. 687,794

Int. Cl.[4] B62D *25/10*

U.S. Cl. 180—89.13 **12 Claims**



1. In a front end loader including a base frame assembly having opposed side members, an engine compartment adjacent one end of said base frame assembly, vertical members extending above said base frame assembly adjacent said one end thereof, and an operator's compartment mounted on said base frame assembly with the operator's compartment including opposed side walls and a cab structure, the improvement comprising:

means associated with said opposed compartment side walls and said opposed base frame side members for permitting said operator's compartment to be moved longitudinally along said opposed base frame side members from a closed position wherein said operator's compartment is substantially in engagement with said vertical members to a forward position wherein said operator's compartment does not obstruct access to the base frame assembly for servicing or repair work; and

wherein each base frame side member including a first guide means and each said compartment side wall including a second guide means, first contact means on said base frame side member cooperating with said second guide means and second contact means on said compartment side wall cooperating with said first guide means whereby said first and second contact means permitting relative movement between said first and second guide means.

4,682,667

POWER TRAIN CONTROL METHOD FOR SLIP PREVENTION

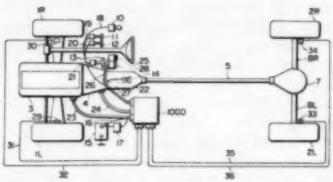
Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1984, Ser. No. 680,881

Claims priority, application Japan, Dec. 14, 1983, 58-234143

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **2 Claims**



1. A method of controlling an automotive vehicle having a driving wheel driven by a power train and a non-driving wheel, the power train including an engine and a transmission, the method comprising the steps of:

detecting a peripheral speed of the driving wheel and generating a first peripheral speed indicative signal indicative of said peripheral speed of the driving wheel;

detecting a peripheral speed of the non-driving wheel and generating a second peripheral speed indicative signal indicative of said peripheral speed of the non-driving wheel;

determining a ratio of a difference between said first and second peripheral speed indicative signals to said first peripheral speed indicative signal and generating a slip rate indicative signal indicative of the value of said determined ratio;

determining from the slip rate indicative signal a deviation of the value of said determined ratio from a predetermined target slip rate value and generating a deviation indicative signal indicative of said determined deviation; and

controlling the power train in response to said deviation indicative signal such that an output torque produced by the power train is varied in a direction as to decrease said deviation indicative signal toward zero whereby said indicative value of said slip rate indicative signal is kept at said predetermined target slip rate value,

wherein said controlling step comprises the steps of:

causing the power train to increase the output torque produced thereby when said deviation indicative signal indicates that the indicative value of said slip rate indicative signal is lower than predetermined target slip rate value; and

causing the power train to decrease the output torque produced thereby when said deviation indicative signal indicates that the indicative value of said slip rate indicative signal is higher than said predetermined target slip rate value.

4,682,668

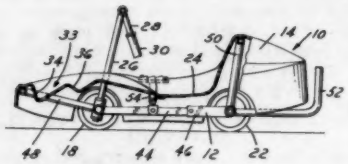
GO-CART

Michael E. Salmon, 2622 Makin, Flint, Mich. 48504, and Paul W. Hunkele, 1506 Williamsburg, Flint, Mich. 48507

Filed Jun. 20, 1985, Ser. No. 747,169

Int. Cl.[4] B62D *61/12*

U.S. Cl. 180—209 **26 Claims**



1. A motorized vehicle comprising:

a chassis having a longitudinal axis, and a front and rear transverse axis each of which have two ends and are perpendicular to the longitudinal axis;

a pair of spindle assemblies each having two ends, the first end pivotably affixed to the chassis at opposite sides of the first transverse axis and pivotable about a steering axis having positive chamber, and the second end projecting outwardly therefrom;

a pair of steerable front wheels each freely rotatably attached to a spindle assembly second end whereby when the wheels and spindle assembly are steered during a turning maneuver the inside wheel moves downwardly and the outside wheel moves upwardly causing the load borne by the inside rear wheel to significantly reduce independent of vehicle speeds;

a pair of rear wheels rotatably affixed to opposite ends of an elongated rear axle, the axle cooperating with the chassis, rotatable about the rear transverse axis;

a motor affied to the chassis and coupled to the rear axle for driving the vehicle; and

wherein the vehicle has a wheel base which is less than or equal to the vehicle's track.

4,682,669

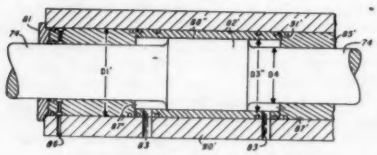
TRANSPORTABLE HYDRAULIC SEISMIC TRANSDUCER

Richard M. Weber, Prosper, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 465,399, Feb. 10, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 830,487

Int. Cl.[4] G01V *1/09*; H04R *11/00*

U.S. Cl. 181—114 **4 Claims**



1. A transportable hydraulic seismic transducer comprising:

(a) a transport means for transporting the hydraulic seismic transducer;

(b) a pad for imparting elastic waves to the underlying ground;

(c) a seismic energy source attached to the transport means and to the pad, the source having a reaction mass with a single diameter cylindrical bore extending entirely therethrough, an actuator rod comprising a piston and at least one piston rod having a diameter less than said piston located within the bore, and at least one bushing premachined before insertion into the bore, fixed within the bore and having an inside diameter of a size to provide a bearing surface for the piston rod;

(d) a cylindrical liner premachined before insertion into the bore, fitted within the bore, having an inside diameter of a size to accommodate the piston, wherein the piston is ringless and the liner is comprised of a bushing material; and

(e) hydraulic system means operatively connected to the seismic energy source for causing the source to vibrate at desired frequencies.

4,682,670

PORTABLE ADJUSTABLE ACOUSTIC ABSORBER

Lawrence Lerner, Beverly Hills, and Stephen P. Diskin, Los Angeles, both of Calif., assignors to Mega/ERG, Incorporated, Beverly Hills, Calif.

Filed Jul. 28, 1986, Ser. No. 890,813

Int. Cl.[4] E04B *1/82*

U.S. Cl. 181—287 **4 Claims**

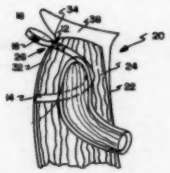
1. A portable adjustable absorber comprising: a plurality of sound absorbent panels; an equal plurality of connecting means capable of grasping at one or more points along their peripheries and of supporting rigidly outward in substantially cantilevered fashion said plurality of panels, and formed with a suitable circular opening for attachment; a central support means characterized by a cylindrical shaft of a diameter corresponding to that of the opening in each connecting means such that a stack of connecting means with absorbent panels attached thereto may be assembled and be freely rotatable about the axis of said central support means, thus forming an adjustable and collapsible helix of both variable pitch and exposure of surface area of absorptive material by rotation of said panels with respect to one another through any angle, therefore permitting control of total sound absorption, or the collapsing of the helix into a compact prismatic profile when all of said absorptive panels are stacked forming an overall minimum dimension of the device for storage or transport; and base means for support and positioning of the entire device as desired adjacent to any interior environmental enclosure surface.

4,682,671

SAFETY HARNESS

Gary M. Hengstenberger, 948 Impala Dr., Akron, Ohio 44319; John I. Montavon, 1000 Jean Ave., Akron, Ohio 44310, and David C. Fuller, Akron, Ohio, assignors to Gary M. Hengstenberger and John I. Montavon, both of Akron, Ohio

Filed Feb. 24, 1986, Ser. No. 832,326
Int. Cl.[4] A65B *35/00*
U.S. Cl. 182—3 14 Claims



1. Safety apparatus, comprising:

a continuous loop of material connected to itself at a point to define a first larger loop and a second smaller loop;

a jacket receiving said continuous loop of material;

loop passes wherein said jacket around a back portion of said jacket and said smaller loop extends out from said jacket and is maintained at a neck portion of said jacket; and

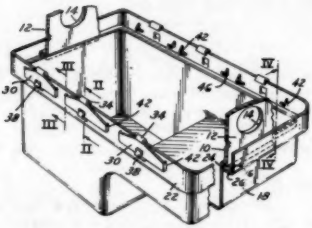
wherein said larger loop passes from said back portion of said jacket to a front portion of said jacket below a point where arms extend from said jacket, said larger loop thence returing to said neck portion of said jacket.

4,682,672

SNAP-ON OIL PAN

Alvin H. Berger, Wyandotte, and Roy E. Diehl, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 21, 1986, Ser. No. 854,286
Int. Cl.[4] F16N *31/00*
U.S. Cl. 184—106 11 Claims



1. A clip-on type oil pan for attachment to the bottom edge of the skirt of an engine block, the edge including a horizontal ledge extending circumferentially around and outwardly from the skirt, the pan being formed adjacent its upper portion with a trough shaped portion with vertical side walls adapted to receive the ledge therein for attachment of the pan thereto, and fastening means for flexibly securing the pan to the ledge,

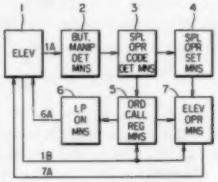
the fastening means including slot means in the outermost wall of the trough-shaped portion, and flexible retaining means secured to the pan and partially insertable through the slot means above the ledge, the retaining means having a portion thereof resting on the ledge supporting the pan therefrom and locking the pan to the block.

4,682,673

ELEVATOR CONTROL APPARATUS

Yasukazu Umeda, Kasugai, and Shintaro Tsuji, Nagoya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 21, 1986, Ser. No. 820,222
Claims priority, application Japan, Jan. 21, 1985, 60-8671
Int. Cl.[4] B66B *1/20*
U.S. Cl. 187—126 5 Claims



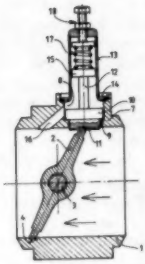
1. An elevator control apparatus comprising a destination floor call registration device installed in an elevator cage and carrying a plurality of buttons corresponding to a plurality of floors, button manipulation detection means for detecting manipulation of each of said plurality of buttons, special operation code detection means for determining the presence of a request for a special operation when manipulations of preset ones of said plurality of buttons are registered in a predetermined sequence within a predetermined period of time, special operation setting means for activating the requested special operation when said special operation code detection means has determined the presence of the request for special operation, and ordinary call registration means for performing ordinary call registration and operation when said special operation code detection means has not determined the presence of the request for special operation.

4,682,674

APPARATUS FOR LIMITING BACK PRESSURE IN AN EXHAUST-TYPE ENGINE SUPPRESSOR

Alfred Schmidt, Burgstrasse 11, Pottenstein/Ofr, Fed. Rep. of Germany (8573)

Filed Aug. 7, 1985, Ser. No. 763,216
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430028
Int. Cl.[4] F02D *9/06;* F01N *7/00;* F16K *3/00*
U.S. Cl. 188—273 3 Claims



1. Apparatus for limiting back pressure in an exahust-type suppressor comprising a butterfly-type throttle valve pivotally mounted about a valve pivot in an engine exhaust pipe of circular cross-section, such that the throttle valve can be moved from an open position to a closed position, the throttle valve having a rim and assuming an oblique attitude when in the closed position, a valve bore communicating with the

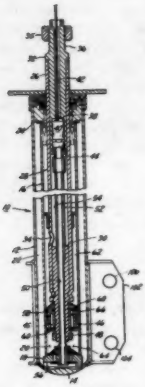
exhaust pipe at a location which is circumferentially spaced and longitudinally offset from the valve pivot so as to correspond with a location occupied by an end face portion of the throttle valve rim remote from the pivot when the valve is in closed position, a valve poppet slidable in the bore, and a spring disposed outwardly of the exhaust pipe with respect to the poppet for urging the poppet inwardly toward the throttle valve and permitting movement of the poppet outwardly in response to a back pressure of predetermined value being created in the exhaust pipe so as to provide a bypass around the throttle valve, the poppet valve having a concave end face which conforms in curvature to the curvature of the exhaust pipe.

4,682,675

VARIABLE RATE SHOCK ABSORBER

William C. Eddy, Jr., West Bloomfield, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 25, 1985, Ser. No. 801,657
Int. Cl.[4] F16F *9/46*
U.S. Cl. 188—299 **15 Claims**



1. A variable rate shock-absorber of the type having an enclosed working cylinder, an external housing circumscribing the working cylinder and one end thereof to form a fluid reservoir, a piston disposed in the working cylinder dividing the interior of the working cylinder into an upper and lower working chamber, means provided at the end of the working cylinder connecting the lower working chamber with the reservoir, and a hollow piston rod slidably received in the other end of the working cylinder, said piston rod having one end connected to the piston and the opposite end extending external to the working cylinder, the variable rate shock-absorber characterized by:

a telescoping cylinder disposed in said working cylinder having one end in fluid communication with the reservoir and the other end slidably received into the interior of said hollow piston rod; and

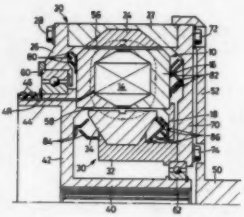
solenoid valve means disposed in the hollow piston rod and connected to the other end of said telescoping cylinder, said solenoid valve means having an inlet port in fluid communication with said upper working chamber and an outlet port in fluid communication with the reservoir through the interior of said telescoping cylinder, said solenoid valve means responsive to an electrical input signal to switch between an open state enabling a fluid flow between said inlet and outlet ports and a closed state inhibiting a fluid flow between said inlet and outlet ports.

4,682,676

ELECTROMAGNETIC POWDER CLUTCH WITH TWO POWDER GAPS

Kiyohito Murata, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 15, 1985, Ser. No. 787,757
Claims priority, application Japan, Oct. 26, 1984, 59-226174; Jan. 10, 1985, 60-2037[U]; Jan. 10, 1985, 60-2038[U]
Int. Cl.[4] F16D *37/02, 27/02*
U.S. Cl. 192—21.5 **5 Claims**



1. An electromagnetic powder clutch of double-gap type comprising:

an annular driven rotary member incorporating therein a solenoid coil and having a portion which is made of a magnetic material and which surrounds said solenoid coil;

a connecting member made of a non-magnetic material;

first and second driving rotary members disposed radially outwardly and inwardly of said annular driven rotary member, respectively, and connected to each other by said connecting member, said first driving rotary member and said driven rotary member cooperating to define a first powder gap therebetween, and said second driving rotary member and said driven rotary member cooperating to define a second powder gap therebetween, said first and second powder gaps accommodating therein first and second masses of magnetic powder, respectively, said first and second driving rotary members including radially inner and radially outer portions made of a magnetic material, respectively, said radially inner and outer portions of the first and second driving rotary members being opposite to radially outer and inner surfaces of said driven rotary member, respectively; and

a labyrinth device disposed to separate said first and second annular powder gaps from each other.

4,682,677

FREE WHEEL WITH SELF-CENTERING CAGE

Olivier Message, Antony, France, assignor to SKF Compagnie D'Applications Mecaniques, Clamart, France

Filed Aug. 20, 1985, Ser. No. 767,532
Claims priority, application France, Sep. 11, 1984, 84 13926
Int. Cl.[4] F16D *41/07*
U.S. Cl. 192—41 A **7 Claims**

1. A self-centering free wheel of the type incorporating a plurality of cams (3) for jamming abutment between the inner surface of a bore (2) and the outer surface of a shaft (1) disposed within said bore, and comprising

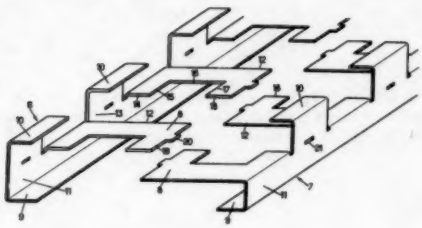
a cage (5) comprising two identical half cages (6,7) disposed between said shaft and said bore surface, and supporting said cams therein,

a spring (4) within said cage for simultaneously providing a tilting torque to said cam while radially retaining said cams within said cage, each of said half cages having bearing surfaces (9) on one side thereof for bearing against the surface of the shaft (1) and havign bearing surfaces (10) on the other side thereof for bearing against the surface of said bore (2) and to transmit a radial force from one surface to the other surface,

each of said half cages including an intermediate cylindrical

envelope (8) having a diameter which is intermediate the diameter of said shaft and of said bore,

said intermediate cylindrical envelope (8) on eah of said half cages having notches, said notches being arranged to form a plurality of rectangular openings in said cylindrical envelope when said half cages are fitted together by axial movement to form said cage (5), each of said rectangular openings having edges which are located on both of said half cages,



said spring (4) disposed between said cylindrical envelope (8) and bearing surface 9 of said cage,

each of said cams supported in one of said rectangular openings in said cylindrical envelope when said half cages are fitted together,

said spring engaging and retaining said cams within said cage,

said cams within said rectangular openings comprising means for axially locking said half cages together.

4,682,678

GEARING UNITS FOR USE WITH MINING EQUIPMENT

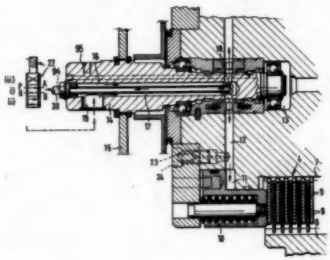
Willy Kussel, Werne, and Werner Bohle, Lüdinghausen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Continuation of Ser. No. 563,487, Dec. 20, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 815,307

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248084

Int. Cl.[4] F16D *25/063, 43/21*

U.S. Cl. 192—56 F **5 Claims**



1. A gearing unit comprising:

(a) an input shaft;

(b) an output shaft;

(c) gearing for drivably interconnecting the input shaft to the output shaft;

(d) a releasable clutch incorporated in the gearing and normally interconnecting said input shaft to said output shaft;

(e) said clutch including a chamber for receiving pressure fluid for releasing said clutch;

(f) a hollow, fixed spigot means projecting into one of said shafts adjacent said chamber and including means defining separate fluid flow paths leading to and from said chamber;

(g) a rapid acting electromagnetic switchable valve device operatively coupled to said spigot means in close vicinity to said chamber and operable to cause pressure fluid to circulate to and from said chamber via said fluid flow paths;

(h) means responsive to switching of said valve device to a first state for creating an initial pre-determined lower circulating pressure fluid flow to the release chamber when the clutch is operating to couple said input shaft to said output shaft via said pressure fluid flow paths to insure that a pre-determined lower pressure prevails within said chamber;

(i) a load sensor which provides an electrical signal depending on the load transmitted through the gearing; and

(j) means for actuating the valve device to shift said valve device to a second state in response to said signal in event of excessive loading to cause said circulating pressure fluid flow to increase in pressure and said chamber to be exposed to a higher threshold pressure to release said clutch and disconnect said output shaft from said input shaft and to cause said clutch release to occur in a time not more than 25 milliseconds.

4,682,679

VISCOUS DRIVE WITH VARIABLE PUMP ACTION

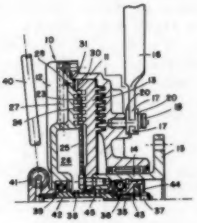
Arthur E. H. Elmer, Nailsworth, England, assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Mar. 3, 1986, Ser. No. 835,732

Claims priority, application United Kingdom, Apr. 9, 1985, 8509041; Jun. 21, 1985, 8515790

Int. Cl.[4] F16D *35/00, 43/25*

U.S. Cl. 192—58 C **6 Claims**



1. A viscous fluid transmission including a rotary casing and a rotary element within the casing, the casing and the rotary element being connected respectively to two drive shafts, a quantity of viscous fluid within the casing, means for pumping the fluid from its normal position in the casing into a holding reservoir or other displaced zone so as to reduce the quantity of fluid in contact with the rotary element and hence the transmitted torque, means for varying the pumping action to modify the quantity of fluid in the casing; said pumping means including cooperating elements on the casing and the rotary element, said pumping means being modified by movement of the rotary element relative to the casing in an axial direction.

4,682,680

FRICTION CLUTCH WITH MANUALLY DISCONNECTABLE RELEASE MEANS

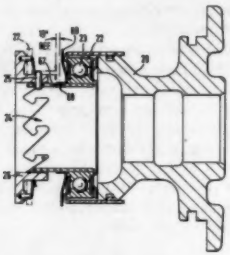
Robert J. Ball, Leamington Spa, England, and John J. Winters, Edmonds, Wash., assignors to Automotive Products plc, Leamington Spa, England

Filed Jun. 7, 1985, Ser. No. 742,699

Claims priority, application United Kingdom, Jun. 7, 1984, 8414507

Int. Cl.⁴ F16D *19/00*

U.S. Cl. 192—98 **19 Claims**



1. A friction clutch for a vehicle comprising: a friction plate; means to press said friction plate in a first direction parallel to the clutch axis; clutch release means for applying clutch release forces in a withdrawal direction opposed to said first direction, said clutch release means including a first member and a second member which applies clutch release forces to said first member, one of said members having a recess, the other of said members having a projection, said projection being receivable in said recess upon relative movement in an axial direction between said members, said recess being defined between a lead-in surface extending at an angle to the said axial direction and a location surface transverse to said axial direction and providing an axial location for said projection, a retainer surface adjacent said traverse space, said retainer surface being arranged to inhibit disengagement of said projection from said recess on application of said clutch release forces; whereby interengagement of said first and second members by relative axial movement therebetween will cause said projection and lead-in surface to interengage and effect relative rotation between said members until said projection fully engages said recess whereupon subsequent movement of said second member axially in the withdrawal direction will cause the projection to engage said location surface and enable clutch release forces to be transmitted to the first member from said second member through said location surface.

4,682,681

ESCALATOR

Katsuya Teranishi, Katsuta; Kazuhira Ozima, Kasama; Cyuichi Saito, Katsuta, and Hiroyasu Ogawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

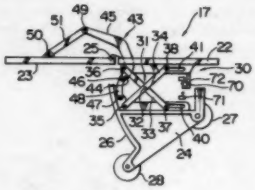
Filed Mar. 25, 1986, Ser. No. 843,619

Claims priority, application Japan, Mar. 27, 1985, 60-60790; Mar. 28, 1985, 60-61987; Jun. 12, 1985, 60-126108; Jun. 28, 1985, 60-140350

Int. Cl.⁴ B66B *23/12*

U.S. Cl. 198—333 **7 Claims**

1. An escalator having a body frame and a plurality of staircase steps connected in an endless manner and supported by said body frame, wherein at least one of said plurality of staircase steps is made for a wheel chair loading staircase step, said wheel chair loading staircase step comprising: a main tread board movable upwardly; a sub-tread board supported by said main tread board; means for lifting said main tread board and said sub-tread board; electric drive means for driving said lifting means; and means for automatically moving said sub-tread board relative to said main tread board to provide a combined planar tread surface of said wheel chair loading



staircase step in accordance with an upward movement when said lifting means is driven by said drive means to lift said main tread board and said sub-tread board upwardly.

4,682,682

FEEDING CONVEYOR FOR FEEDING ARTICLES LATERALLY ONTO ANOTHER CONVEYOR, PARTICULARLY A SORTING CONVEYOR

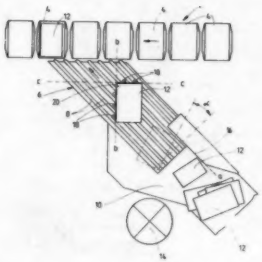
Karl H. Hartlepp, Ronde, Denmark, assignor to Kosan Crisplant A/S, Aarhus N., Denmark

Continuation of Ser. No. 639,405, Aug. 10, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 909,923

Claims priority, application Denmark, Aug. 11, 1983, 3654-83

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—368 **5 Claims**



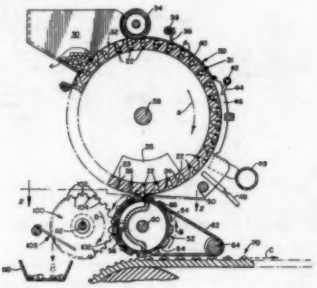
1. A feeding conveyor for feeding articles laterally onto another conveyor, particularly a sorting conveyor, by a movement obliquely inwardly and forwardly towards the latter conveyor, in an intermediate area of the feeding conveyor there is arranged a generally V-shaped stop means comprising an operationally unitary structure for temporarily stopping as well as centering and lining up of articles in conjunction with the action of said feeding conveyor, said V-shaped stop means being movable towards and retractable away from its stop position as a unit for releasing the centered and lined up article for transfer thereof to the sorting conveyor.

4,682,683

METHOD AND APPARATUS FOR REMOVING IMPROPERLY ORIENTED ARTICLES FROM A MOVING ARTICLE

Charles E. Ackley, Sr., Sarasota, Fla., and Charles E. Ackley, Jr., Tuckerton, N.J., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 939,066, Sep. 1, 1978, Pat. No. 4,437,559. This application Mar. 16, 1984, Ser. No. 590,201
The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—380 5 Claims



1. Apparatus for arranging individual ones of a plurality of substantially similar articles in a regularly spaced moving two-dimensional array, positioning those individual articles substantially uniformly in the array and transporting the array to a work station, comprising:

(a) means for storing a plurality of said articles;

(b) rotatable drum means for removing said articles from said storage means;

(c) means for positioning said articles uniformly with respect to one another while moving on a curved surface of said rotatable drum, at positions in an arrangement, corresponding to said array;

(d) means for removing improperly positioned articles from said positions within said arrangement corresponding to said array while moving along a curved path defined by a rotating cylindrical drum;

(e) means, receiving said arranged articles after said improperly positioned articles have been removed, for transporting said articles, in said spaced two-dimensional arrangement defining said array, to a work station.

4,682,684

METHOD AND AN ARRANGEMENT FOR THE FEEDING OF OBJECTS

Stig A. Löthman, Veberöd, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Continuation of Ser. No. 335,597, Dec. 30, 1981, abandoned. This application Jun. 26, 1985, Ser. No. 749,115
Claims priority, application Sweden, Jan. 19, 1981, 8100247
Int. Cl.[4] B65G *47/31*
U.S. Cl. 198—461 18 Claims

1. A method for transferring an object from a first conveyor moving at a first speed to a second conveyor moving at a second speed which is higher than said first speed, comprising:

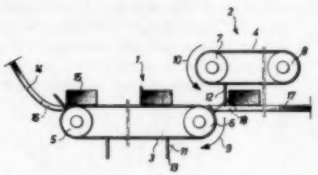
providing said first conveyor with a pair of pulleys of predetermined radius; said first conveyor comprising a flat run and an arcuate run that extends over said pair of pulleys;

spacing the second conveyor with respect to the first conveyor;

contacting the object with an urging element positioned on the first conveyor to push the object at the speed of the flat run of the first conveyor;

providing the urging element with a contact surface at an end displaced from the conveyor belt;

increasing the linear speed of a free end portion of the urging element by tipping the urging element forwardly as it passes around the arcuate run of the first conveyor;



providing the urging element with a predetermined length which is greater than the predetermined radius of one of said pair of pulleys;

accelerating the object by contacting the object with said contact surface of the urging element during the increase of speed; and

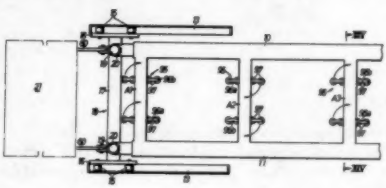
contacting the object with a portion of the second conveyor after the object has been accelerated by the urging element.

4,682,685

CONVEYOR IN PLASTIC WORKING MACHINE

Hiroyasu Yamada, Kawagoe; Motoatsu Shiraishi, Sakado; Ken Tazou, Hidaka; Mitsuki Nakamura, Niiza; Ryoichi Kageyama, Sayama; Akira Namiki, Tokorozawa, and Masaru Sasagawa, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 692,800, Jan. 18, 1985, Pat. No. 4,625,540. This application May 22, 1986, Ser. No. 866,018
Claims priority, application Japan, Jan. 20, 1984, 59-8097; Nov. 6, 1984, 59-233968; Nov. 6, 1984, 59-233969; Nov. 12, 1984, 59-238101; Nov. 12, 1984, 59-238102
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—621 4 Claims



1. In a working machine having pairs of lower dies and upper dies disposed at a plurality of working stations, respectively, for cooperatively working a workpiece at the respective stations, the stations being set at intervals in a direction of conveyance of the workpiece,

a conveyor comprising:

a pair of transfer bars disposed at opposite lateral sides of each working station of said plurality of working stations and extending parallel to each other in the conveying direction, said pair of transfer bars being connected together by a plurality of arms which are bridged laterally between said bars against relative movement to the bars and being movable vertically as well as in the conveying direction by respective driving means; and

a handling mechanism disposed on each arm for holding the workpiece;

wherein the handling mechanism comprises holding means for holding the workpiece, a horizontal rod attached with

said holding means and rotatable substantially on a horizontal plane between a projecting state in which the rod is substantially perpendicular to the associated arm and an enclosed state in which the rod is substantially parallel with the associated arm, and a shaft for rotatably carrying the horizontal rod on the arm, said shaft being driven by a driving means to effect rotating movement of the rod,

whereby during operation of the conveyor, the horizontal rod of the handling mechanism is moved to the projecting state for holding and releasing the workpiece by said holding means, thereby allowing, in cooperation with the operation of said transfer bars, the workpiece to be conveyed in sequence from working station to working station.

4,682,686

ARTICULATED BELT CONVEYOR

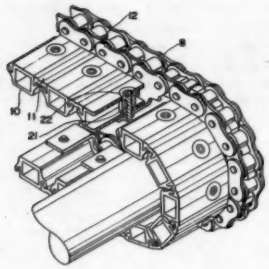
Kouzou Ueda, Yamato; Daisuke Nagumo, Osaka; Hirotetsu Shuto, Kobe, and Hiroaki Kuriyama, Takasago, all of Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd., Hyogo, Japan

Filed Jan. 2, 1986, Ser. No. 815,999

Claims priority, application Japan, Jan. 16, 1985, 60-6144; Jun. 14, 1985, 60-130390

Int. Cl.[4] B65G *15/30*

U.S. Cl. 198—844 **15 Claims**



1. A conveying apparatus which comprises:

a pair of sprockets provided at front and rear ends thereof;

a pair of endless chains passed around said sprockets at opposite sides thereof;

a plurality of support members arranged at regular intervals, each having a box-like cross section and extending in a direction perpendicular to the direction in which said support members travel for supporting objects to be carried on its upper support surface;

a plurality of fastening members for fastening said support members to said chains;

a connecting means for connecting said support members to said fastening members;

a pair of holding portions disposed on front and rear faces of each of said support members; and

a plurality of covering members each securely connected between adjacent support members and forming a continuous surface with the upper support surface of each of said adjacent support members, each covering member being connected at front and rear ends thereof to said holding portions of adjacent support members for covering each gap defined therebetween.

4,682,687

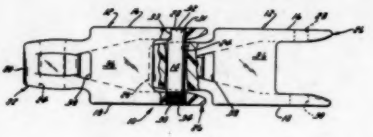
PINTLE CHAIN INCLUDING SELF-RETAINING PIN

James W. Leege, Greendale; Robert E. Stacey, Waukesha, and Russell H. C. Uttke, Greendale, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 378,373, May 14, 1982, abandoned. This application Feb. 1, 1985, Ser. No. 697,196

Int. Cl.[4] B65G *17/06*

U.S. Cl. 198—852 **1 Claim**



1. In a conveyor chain of the type comprising a plurality of pintle links and a plurality of metal pins connecting said links together, each link being of a polymeric material and comprising first and second sidebars and a barrel portion connecting said sidebars at a first end; said barrel portion having a bore for receiving one of said pins; said first and second sidebars having second ends spaced wide enough apart to receive the barrel portion of an adjacent link; each sidebar having an aperture at its second end, such that two adjacent links are pivotally connected by means of one of said pins which is received by the bore in the barrel of one link and by the apertures in the second ends of the sidebars of the other link, the improvement comprising:

the entire length of the aperture through the first sidebar has the same diameter and shape and the entire length of the aperture through the second sidebar has the same diameter and shape such that both sidebars are recess free around the apertures;

each of said pins being substantially cylindrically shaped and having first and second ends which are entirely contained and terminate within the apertures of said first and second sidebars, respectively, whereby smooth link sides are provided without placing the pin ends in sidebar recesses;

said second end of each pin having a knurled outer surface adapted to frictionally engage the surface of said aperture in said second end of said second sidebar to hold said pin against axial movement relative to said first sidebar;

the aperture in the second end of the second sidebar being substantially cylindrical and sized to receive said knurled end of said pin with an interference fit;

the aperture in the second end of the first sidebar having a noncylindrical shape;

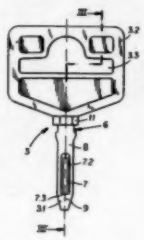
the first end of each pin including noncylindrical means having an interference fit in the aperture of the second end of the first sidebar for preventing rotation of the knurled surface of the second end of the pin in the aperture in the second end of the second sidebar and the grinding away of the polymeric material of the second sidebar by the metal knurled surface; and

said first sidebar including an inner surface adjacent said aperture in said first sidebar and facing said second sidebar and spaced from said second sidebar, said first end of said pin including a shoulder engageable with said first sidebar inner surface when said first end of said pin is housed in said aperture in said first sidebar.

4,682,688
SECURED CONTAINER AND LOCKING DEVICE FOR SAME

Günter H. Budert, Giengen/Brenz, Fed. Rep. of Germany, assignor to Firma Georg Knoblauch, Giengen/Brenz, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,453
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 8501735[U]
Int. Cl.[4] A45C 13/10
U.S. Cl. 206—1.5 7 Claims



1. A locking device for locking two parts of a container together, said parts of said container having aligned openings through which said device can be inserted to retain said parts in a closed position relative to one another, said device comprising:

a handle adapted to be gripped by a user desiring to open and close said container, said handle being wider than said openings so that said handle remains external of said container when said device is inserted in said openings;

a shank connected to said handle and of a length generally equal to a thickness of said container traversed by said device in a locking position of said device in said openings;

a detent connected to said shank and having at least one stop surface extending transverse to said shank and engageable with an inner wall of said container for retaining said device against withdrawal from said openings, and surfaces converging away from said handle to facilitate insertion of said detent through said openings, thereby enabling said stop surface to engage said wall; and

an elongated blade-shaped tongue extending away from said detent in line with said shank and formed with an outwardly projecting yieldable barb converging toward said tongue away from said handle and having a deflectable end turned toward said handle but spaced from said detent by a bridge piece of said tongue whose length is greater than said thickness and which can be cut through so that, upon withdrawal of said detent from said container, enough of said bridge piece is exposed outside said container to permit said bridge piece to be cut through, whereby a tongue portion carrying said barb can fall into said container but said detent remains on said handle to permit reinsertion of said detent into said container to relock the same.

4,682,689
DUAL COMPARTMENT CONTAINER

Joseph J. Pereira, West Redding, Conn.; Malcolm E. Taylor, Pelham, and Bernard Sawaf, Nashua, both of N.H., assignors to Clairol Incorporated, New York, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,651
Int. Cl.[4] B65D 25/08, 1/04
U.S. Cl. 206—222 10 Claims

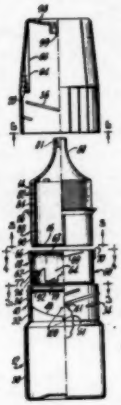
1. A dual-compartment container for containing a different substance in each compartment, and for isolating said substances until the container is ready for use, comprising:

a first container having a cylindrical, threaded neck portion;

a second container rotatably and sealingly secured within said neck portion, the bottom end of said second container sealed by a membrane;

a cap for threadably engaging said neck portion;

means interposed between said cap and said second container for enabling common rotation in a predetermined direction;



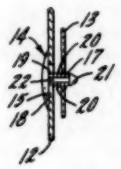
a substantially annular knife member interposed between said first and second containers for piercing said membrane upon rotation of said cap in said predetermined direction and consequent rotation of said second container relative to said first container;

means for translating rotary motion of said cap to longitudinal motion of said knife member relative to said second container.

4,682,690
DISPLAY PRODUCT AND PACKAGE COMBINATION

James J. Tiffany, Roscoe, Ill., assignor to Newell Co., Freeport, Ill.

Filed May 15, 1986, Ser. No. 863,571
Int. Cl.[4] B65D 73/00
U.S. Cl. 206—305 3 Claims



1. In combination:

a display package and

a product to be displayed,

said display package having a support member arranged to be located behind the product to be displayed when the package and product are assembled for display,

said product having a wall which forms part of the product and so arranged as to lie in opposing relationship to the support member of the display package when the package and product are assembled for display,

support structures which provide at least three point support for the product when said product is separated from the display package and placed upon a supporting surface,

said support structures extending outwardly from the said product wall whereby the product, when placed on the supporting surface, is located a given distance from the supporting surface,

first aperture means in the support member of the display package and second aperture means in the product wall,

said first and second aperture means being axially aligned with one another when the package and product are assembled for display,

fastener means received in the first and second aperture means and arranged to maintain the package and product in fixed, spaced relationship to one another when the package and product are assembled for display,

the outermost extremity of the fastener means extending outwardly beyond the product wall a distance up to and including a distance greater than the distance the support structures extend outwardly from said product wall when the product has been removed from the package when there is no change in the spatial relationship between the fastener means and the product,

said fastener means having insertion means which enable the fastener means to be moved toward the product to a position in which the outwardmost extremity of the fastener means is located closer to the product wall than the support structures.

4,682,691

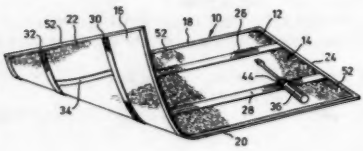
ROLL-UP VELCRO TOOL CARRIER

Johan R. Spiering, 105 Queen Anne Road, Toronto, Ontario M8X 1T3, Canada

Filed Apr. 7, 1986, Ser. No. 848,804

Int. Cl.[4] B65D *85/20*

U.S. Cl. 206—373 **8 Claims**



1. In combination:

a substantially rectangular sheet of flexible material having two opposed surfaces, a pair of side edges and a pair of end edges, the longer dimension of the sheet being such as to allow the sheet to be rolled up to surround a plurality of implements,

at least one strip of a first adhesive material secured to one surface of said sheet substantially parallel to the pair of side edges, said strip being narrower than the rectangular sheet,

for each strip of said first adhesive material, a strip of a second adhesive material secured to the other surface of said sheet in juxtaposition to its respective strip of first adhesive material,

each adhesive material being of a type to be more pressure engageable to the other adhesive material than to itself the two adhesive materials being disengageable from each other by pulling apart, and

a plurality of pieces of said second adhesive material each said piece being pressure engageable to the strip of first adhesive material on the rectangular sheet and each having means for attachment to implements.

4,682,692

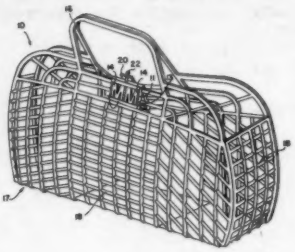
CARRIER WITH INDICIA MOUNTING MEANS

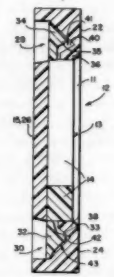
Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed Apr. 22, 1986, Ser. No. 856,442

Int. Cl.[4] B65D *33/00*

U.S. Cl. 206—459 **3 Claims**





1. In a carry-all or pocketbook having at least one wall and defining an interior space for carrying miscellaneous articles, the improvement comprising:

an indicia bearing region integrally molded of flexible or semi-flexible plastic with said carry-all and forming a unitary part thereof, said indicia bearing region constituting means for removably carrying identifying indicia therein, including a recess having a back supporting wall and defined by a generally rectangular frame or border, said rectangular frame or border including opposite side walls and top and bottom walls, said top and bottom walls having interlocking means for releasably retaining upper and lower extensions of identifying indicia, said interlocking means comprising a generally V-shaped channel; and

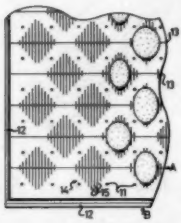
identifying indicia formed of semi-flexible plastic having retaining means including upper and lower retaining elements for mating with said V-shaped channels, said removably inserted into said recess supported by said back wall and with said retaining elements being retained within said generally V-shaped channels, said retaining elements each having a gently sloping wall permitting easy insertion into said V-shaped channels, and an opposite sharply sloping wall making removal from said V-shaped retaining channels more difficult than insertion.

4,682,693

PACKAGING TRAY HAVING FLEXIBLE ZONES IN A SUPPORTING LAYER

Michael S. Moffitt, 1874 S. 900, East Bountiful, Utah 84010, and Brian L. Roberts, 4616 Lanark Rd., Salt Lake City, Utah 84124

Filed Feb. 4, 1986, Ser. No. 825,914
Claims priority, application New Zealand, Feb. 5, 1985, 211041
Int. Cl.[4] B65D 85/34
U.S. Cl. 206—583 6 Claims



1. A packaging tray for supporting articles within recesses, for use in a carton having a base, comprising:

a supporting layer,

supporting means associated with said supporting layer for spacing said supporting layer from said base of said carton,

a plurality of flexible zones in said supporting layer, each comprising a plurality of parallel slits in said supporting layer, dividing said supporting layer within each flexible zone into a plurality of parallel strips, said flexible zones having ends and sides, said parallel slits extending from end to end of said flexible zones, said slits and said strips being progressively shorter toward the sides of said flexible zones, and

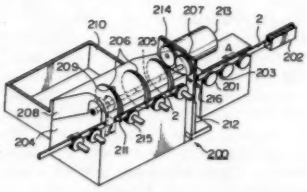
elongation means associated with said strips permitting the length of said strips from end to end of said flexible zones to increase under the pressure supported articles.

4,682,694

METHOD AND DEVICE FOR REMOVING DEFECTIVE PRODUCTS

Takahiro Kumazawa, Anjo; Yoshihiro Nakamura, Tokoname, and Yoshimitsu Yamaguchi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 2, 1985, Ser. No. 751,238
Claims priority, application Japan, Jul. 6, 1984, 59-138968
Int. Cl.[4] B07C 5/36
U.S. Cl. 209—559 12 Claims



1. A device for removing a defective product from a path through which products are continually fed comprising:

means for feeding products along the path,

sensor means for detecting a defective product, and outputting a signal denoting a defect in either the trailing half of a first product or the leading half of an adjacent second product,

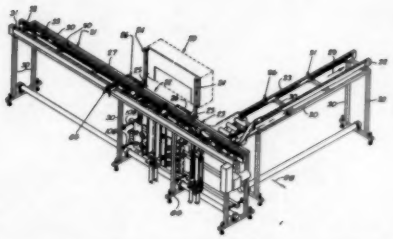
remover means for taking the defective product from the path by removing said first and second adjacent products upon receipt of said signal from said sensor means, said remover means obtaining a number which is a quotient obtained by dividing the distance between said remover and said sensor, by the length of a normal product, said remover means counting the number of products and taking the defective product when the number of products that has passed said remover means is equal to the quotient number obtained by said remover means.

4,682,695

AUTOMATED KEYBOARD TESTING

Ralph D. Hasenbalg, 8635 Rudnick Ave., Canoga Park, Calif. 91304

Filed Mar. 30, 1984, Ser. No. 595,435
Int. Cl.[4] B07C 5/344
U.S. Cl. 209—571 21 Claims



1. A conveyor system for transporting keyboards for automatic testing by a keyboard testing mechanism comprising feed conveyor means for moving keyboards to a test station where the keyboard can be tested, the keyboard testing mechanism being located at said test station, discharge conveyor means whereby keyboards passed by the keyboard test mechanism are distinquished from keyboards rejected by the keyboard test mechanism, means at said testing station for bringing the keyboard and the keyboard mechanism into a testing relationship and thereafter removal of said relationship whereby the keyboard is permitted to move to the discharge conveyer means,

wherein the testing relationship is achieved by relatively closer physical adjacency than during the normal keyboard travel on the conveyor means and by effecting a positive electrical connection between the keyboard and the keyboard testing mechanism thereby to permit keyboard testing and thereafter the removal of the testing relationship permits relative physical removal and electrical separation of the keyboard from the keyboard testing mechanism, and wherein the relative position of the keyboard and the testing mechanism is controlled by a movable gripper mechanism, such gripper mechanism being physically movable between discreet different heights, and the gripping mechanism being adapted to support the keyboard at the test station,

including stop means for stopping travel of a keyboard along the conveyor system upstream of the keyboard test mechanism, such that a keyboard being tested is separated from the upstream keyboard,

wherein the stop means includes means for engaging frictionally the keyboard adjacent to the keyboard side and thereby effect such stopping action,

wherein the gripper mechanism includes a substantially T-piece mechanism, the main limb of the T-piece being vertically disposed and the cross limb of the T-piece being substantially horizontally disposed, and pneumatic means for raising and lowering the T-piece gripping mechanism,

wherein the cross-limb of the T-piece provides as its leading

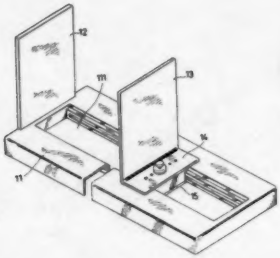
end, barrier means against which the keyboard can physically abut and through which electrical contact is established with the keyboard testing mechanism, and pivoted abutting means at the trailing end of the cross-limb of the T-piece such abuttng means being movable between a retracted position over which the keyboard can proceed, and an extended position positively urging the keyboard forwardly against the barrier means at the leading end of the cross-limb.

4,682,696

ADJUSTABLE BOOKRACK

Muh-Chuan Sheu, No. 642, Chung-Cheng Road, I-Chia Village, Jen-Teh Hsiang, Tainan Hsien, Taiwan

Filed Mar. 27, 1986, Ser. No. 844,789
Int. Cl.[4] A47B *65/00*
U.S. Cl. 211—43 **4 Claims**



1. An adjustable bookrack comprising:
a base including a guideway provided in an upper surface thereof, said guideway having a first frictional surface;
a stationary upright end wall mounted securely at one end of said base;
a movable upright end wall disposed detachably on said guideway of said base;
a gliding member secured to the underside of said movable upright end wall and slidable on said guideway of said base, said gliding member having a chamber;
a braking member releasably disposed under said gliding member, having a second frictional surface opposing said first frictional surface;
means for biasing said braking member toward said gliding member so as to impel said second frictional surface against said first frictional surface;
said biasing means comprising a compression spring disposed within said chamber, an actuator member passing through said compression spring and said chamber to form a handle extending out of said chamber at an upper end thereof, and a stop member secured to said actuator above said compression spring within said chamber for obstructing said spring, said actuator member engaging with said braking member at a lower end; and
at least one rolling element interposed between said guideway of said base and said gliding member so as to reduce the friction therebetween.

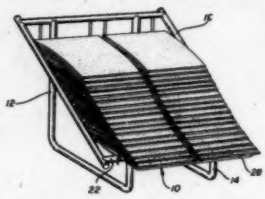
4,682,697

CARPET SAMPLE DISPLAY DEVICE

Melvin Cohen, 2 Brighton Ave., Passaic, N.J. 07055

Filed May 27, 1986, Ser. No. 866,692
Int. Cl.[4] A47F *7/16*
U.S. Cl. 211—45 **13 Claims**

1. A display device for a plurality of carpet samples comprising:
a base;
a rectangular frame slopingly mounted in the top portion of said base, said frame having a back frame member, a front frame member, and a pair of side frame members, said back frame member when assembled thereto, being elevated substantially above said front frame member;
a plurality of bottom support rails interconnecting the medial portions of said front and said back frame members said bottom support rails having a rear portion descending substantially vertically from said back frame member, having a middle portion disposed substantially parallel to said side frame members, and having a front portion extending substantially horizontally to said front frame member; and,



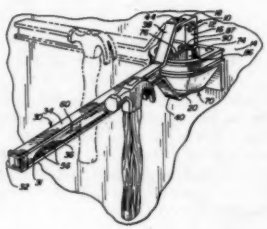
a plurality of sample-holding compartments mounted thereon, each said compartment forming a pigeonhole for one of said carpet samples with said samples being arrayed in a waterfall display;
whereby each carpet sample in one of said compartments has a displayed edge portion which protrudes beyond the end of the adjacent carpet sample in the adjacent rearward compartment.

4,682,698

TOOL HOLDER

Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Mar. 4, 1986, Ser. No. 835,938
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—70.6 **9 Claims**



1. An apparatus for holding ferromagnetic hand tools for convenient storage, said apparatus comprising:
a mounting member for being attached to a generally vertical surface, such as a wall or the like, said mounting member including a bracket having a generally planar mounting plate for being disposed against said wall, said bracket having an outwardly projecting upper portion and an outwardly projecting lower portion spaced below said upper portion, said mounting member also including attachment means for attaching said bracket to said wall;
a generally elongate support frame extending from said mounting member, said support frame defining at least two oppositely facing sides, said support frame having a pair of spaced-apart arms at one end engaging said mounting member, said spaced-apart arms defining between them a receiving region, each said arm extending to one of said bracket projecting portions;

mounting means for pivotally mounting said support frame to said mounting member to accomodate swinging movement of said support frame for providing access to either of said two sides, said mounting means including (1) a connecting pin journaled in said bracket projecting upper portion and one of said arms and (2) a connecting pin journaled in said bracket projecting lower portion and the other of said arms;

a tray removably disposed on said bracket projecting lower portion in said receiving region between said arms, said tray having a configuration to accommodate the movement of said arms during the swinging movement of said support frame; and

an elongate magnet carried by said support frame and extending to each side of said support frame for magnetically attracting and holding said hand tools.

4,682,699

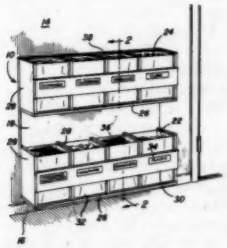
WASTE RECYCLING KIT

Holmes E. Ertley, 699C Friar Ct., Lakehurst, N.J. 08733

Filed Aug. 29, 1984, Ser. No. 645,661

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—71 **4 Claims**



1. A waste recycling kit comprising a supporting rack for positioning at a convenient location adjacent a source of trash, said rack including a plurality of vertically opening compartments with each compartment including indicia designating that compartment receiving a predetermined category of trash, and a disposable bag oriented in each compartment for receiving trash designated for that compartment whereby the categorized trash may be removed from the track along with the bag to facilitate its transport to a recycling facility, an exteriorly mounted container dimensioned to receive a plurality of bags and a cover for said container to protect and retain the bags with categorized trash therein for pickup by a vehicle and personnel, said container being located in-ground adjacent curb side, and a plurality of removable containers in said in-ground containers, each removable container including a bail handle and dimensioned to receive a single bag.

4,682,700

SAFETY CLOSURE AND CONTAINER PACKAGE

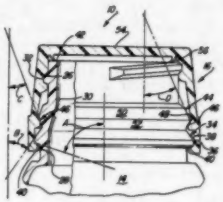
Gary Montgomery, and Gene Hawkins, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Aug. 21, 1986, Ser. No. 898,908

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—216 **7 Claims**

1. A child resistant threaded package comprising, in combination: a container having a threaded neck and an outwardly extending retention flange on said neck below said threads, said flange having an upwardly and inwardly directed surface extending from an apex into said neck and an abrupt inwardly directed lower surface, extending downwardly from said apex at an angle of 45° to 90° towards said neck; and a closure cap with an annular skirt having complementary threads for engaging said container threads and an inwardly projecting retention bead below said threads having a minimum diameter less than said container flange apex, said flange and bead being so spaced from said threads that as said cap is threaded onto said container neck, said cap retention bead is gradually expanded as it moves axially along said upper flange surface so that the



smaller diameter bead snaps over the larger diameter flange apex and upon retrograde rotation of said cap in a opening direction, said bead will coact with said lower flange surface to resist removal, providing a child resistant feature requiring more force for removal than application.

4,682,701

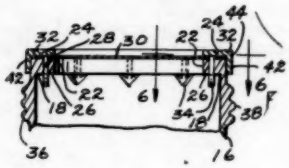
TAMPER-PROOF CONTAINER

Gary P. Katz, 10 Stockton Rd., Silver Spring, Md. 20901

Filed Jun. 9, 1986, Ser. No. 871,849

Int. Cl.[4] B65D *41/50*

U.S. Cl. 215—230 **21 Claims**



1. A tamper-proof container, comprising:

a bottom wall;

at least one sidewall defining an outer surface and projecting upwardly from said bottom wall to form an upper edge;

a first annular ring member integral with said upper edge of said sidewall and defining an open mouth area of said container, said first ring member further defining an upper flat annular surface contiguous with said open mouth area, a lower annular surface and a plurality of openings extending between said upper and said lower annular surfaces;

a thin tearable sheet member located across said open mouth area and positioned onto said upper annular surface;

a second annular ring member defining a plurality of barb-shaped prongs, said second ring member positioned against said sheet on said upper annular surface with said prongs projecting through said sheet and said openings to grippingly engage said lower annular surface; and

means in operative relationship with said sidewall for removably capping said open mouth area.

4,682,702

TAMPER INDICATING CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jun. 27, 1986, Ser. No. 879,487

Int. Cl.[4] B65D *41/32*

U.S. Cl. 215—232 **16 Claims**

1. A tamper indicating dispensing closure for use with a

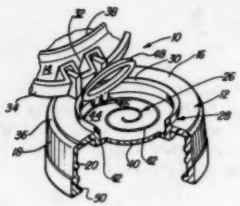
container having a neck with means for attachment to said closure comprising, in combination:

a base cap having a top with a dispensing orifice therein and a depending cylindrical skirt having complementary means for attachment to said container;

a lid for closing said dispensing orifice;

a hinge joining said base cap and lid for swinging said lid from a closed position covering said orifice to an open position for dispensing the contents of said container through said orifice; and

a removable sealing disc extending across said orifice below said lid in its closed position, said disc including:



a spiral weakening groove in the face of said disc extending from the periphery inwardly towards the center of said orifice to define between adjacent turns of the spiral groove a tear strip; and

a pull tab attached to said tear strip adjacent one end thereof;

whereby said sealing disc can be removed as a spiral tear strip by gripping said pull tab and lifting it away from said container, and the initial packaged integrity of the container can be checked by swinging said lid open and observing the condition or absence of said sealing disc.

4,682,703

STOPPER FOR MEDICAL CONTAINER

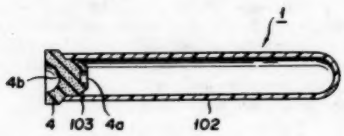
Masaaki Kasai, Fuji, and Kenji Ishikawa, Tokyo, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,342

Claims priority, application Japan, Apr. 25, 1985, 60-87622

Int. Cl.[4] B65D *39/00*

U.S. Cl. 215—247 **7 Claims**



1. A stopper for a medical container which can be pierced with a needle, which stopper is characterized by at least part of the portion of the stopper which comes into contact with a piercing needle during the removal of said piercing needle therefrom is formed of a material containing a highly water absorbable macromolecular compound.

4,682,704

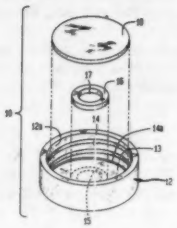
FLOATING CAP SEAL

Ronald N. Kessler, Girard, and Myron E. Ullman, Canfield, both of Ohio, assignors to Boardman Molded Products, Inc., Youngstown, Ohio

Continuation-in-part of Ser. No. 862,455, May 12, 1986, abandoned. This application Nov. 17, 1986, Ser. No. 931,025

Int. Cl.[4] B65D *53/04*

U.S. Cl. 215—329 **19 Claims**



1. A floating cap seal for closing a nonplanar bottle opening, comprising:

a screw cap having a generally planar bottom wall and an adjacent vertically extending circular internally threaded wall forming a cavity;

a thin, flat, resilient circular seal having a diameter substantially equal to the diameter of the cavity and lying within the cavity near the bottom thereof; and

a circular ring having a height of at least about 0.062 inches, said ring having a smaller exterior diameter than the bottle opening, said ring being generally center located between said bottom wall and said circular seal to space said circular seal from said bottom wall, and said seal being adapted to freely rotate relative to said screw cap upon engagement with an upper edge of a bottle opening;

whereby said ring, sandwiched between said circular seal and said bottom wall, defines a rotatable floating seal to effect sealing of said non-planar bottle opening.

4,682,705

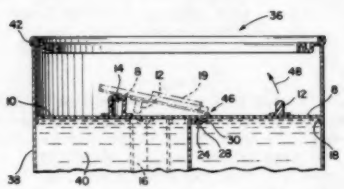
INTERNAL LID FOR A LIQUID CONTAINER

James D. Hurwitz, 6014 Broad Branch Rd., NW., Washington, D.C. 20015

Filed Jun. 19, 1986, Ser. No. 876,001

Int. Cl.[4] B65D *25/10*

U.S. Cl. 220—93 **19 Claims**



1. A lid for protecting the liquid contents of a container, said lid comprising:

a body being sufficiently flexible so that when said body is inserted into a container through an opening located at the top of the container which is smaller than the dimensions of the remainder of the container, said body will be deformed to pass through said opening and resume its original configuration within the container to rest on top of liquid contents of the container forming a seal with the

internal sides of the container to protect the liquid contents of the container from contact with air above said body, and

said body including two portions joined together by hinge means for folding of one portion relative to the other portion so that said one portion rests above said other portion while said other portion rests on top of the liquid contents of the container,

handle means mounted on a top surface of said one portion of said body for removing said body from said container and for lifting said one portion to fold said one portion over said other portion,

said one portion including a projecting rib extending from a bottom surface of said one portion for removing a liquid from a brush as the brush is moved across said projecting rib when said one portion is folded over said other portion to gain access to the liquid contents.

4,682,706

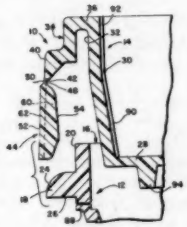
TAMPER INDICATOR FOR USE WITH A RECLOSABLE CONTAINER ASSEMBLY

Frank C. DeVore, Orange, and Marcos A. Argudo, Chino, both of Calif., assignors to Tri Plas, Inc., Ontario, Calif.

Filed Jun. 20, 1986, Ser. No. 876,391

Int. Cl.[4] B65D *41/32*

U.S. Cl. 220—276 **11 Claims**



1. A tamper indicator for use with a reclosable container assembly which includes a container having a locking ledge thereon and a closure member having a skirt thereon which engages the locking ledge to attach the closure member to the container, the tamper indicator comprising:

a tear-off strip means attached to the skirt for locking the closure member to the locking ledge, including

(1) an inner surface having a portion thereof adapted to engage the locking ledge,

(2) an outer surface on a side of said tear-off strip means opposite to said inner surface, and

(3) a plurality of spaced apart grooves defined in said tear-off strip means inner surface to be located at a plurality of positions about the circumference of the container when the closure member and said tear-off strip means are assembled with the container, and

(4) web means covering said grooves so that grooves are not present in said tear-off strip means outer surface whereby said tear-off strip means outer surface forms an essentially uninterrupted and continuous surface, said web means being adapted to break whenever any part of said tear-off strip means inner surface is moved for disengagement from the locking ledge for producing a discontinuity in said tear-off strip means outer surface and providing an indication of attempted or actual opening of a closed container.

4,682,707

CONTAINER HAVING A TAMPER PROOF LID

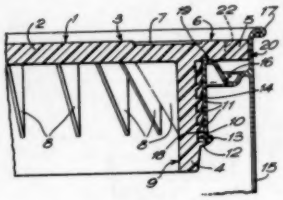
Keith E. Wiles, Norfolk, England, assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 748,512, Jun. 25, 1985, abandoned. This application Feb. 14, 1986, Ser. No. 831,924

Claims priority, application United Kingdom, Jan. 11, 1985, 8500701; Feb. 18, 1985, 8504132

Int. Cl.[4] B65D *39/00*

U.S. Cl. 220—307 **6 Claims**



1. A lid comprising a central panel having an integral depending flange and a surrounding integral outwardly-directed flange for engaging with a corresponding portion of a lever ring of a container to which the lid is fitted with the lever ring having an annular wall and cooperating with said depending flange to provide an annular seal, said depending flange having outwardly-projecting fins flexed to provide a primary seal between said lid and lever ring with the lowermost of said fins having a flat upper wall adapted to engage a lower edge of said annular wall, said lever ring having flat annular surface surrounding said annular wall with said outwardly-directed flange providing a secondary seal with said flat annular surface and in which said container and lever ring have an annular container surface located outwardly and above said annular wall for engagement by a peripheral edge of said outwardly-directed flange to center said depending flange with respect to said annular wall, said outwardly-directed flange having at least one recess for receiving a lever for assisting in removal of the lid to open the container with said recess having a membrane which is ruptured when said lever is inserted into said recess, whereby said lid is made tamper-evident.

4,682,708

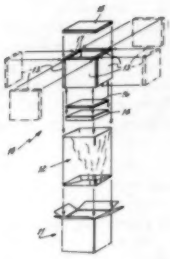
INSULATED SHIPPING CONTAINER

Jerry S. Pool, High Point, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Oct. 15, 1981, Ser. No. 311,337

Int. Cl.[4] B65D *90/04*

U.S. Cl. 220—460 **8 Claims**



1. An improved lightweight insulated shipping container for cold or hot storage having low thermal conductivity comprised of:

a box having a bottom, side walls and a top, said top cooperating with said side walls to form a closure for said box,

an insulated layer located interiorly to said box, said interior layer being composed of at least three panels of open-celled flexible and resilient foam, said panels being sized to fit the interior contours of said bottom, side walls, and top, said panels forming an insulative storage compartment in said box,

a vapor barrier surrounding and enclosing said insulative storage compartment and located exteriorly to said panels.

4,682,709

COIN-OPERATED VENDING MACHINE

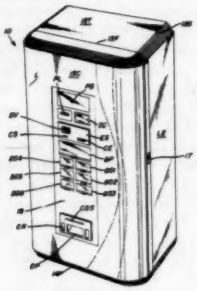
John H. Brandes, Atlanta; Eddie W. King, Marietta, and Don S. Summerville, Snellville, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jun. 22, 1984, Ser. No. 623,123

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[4] G07F *7/04, 9/02*

U.S. Cl. 221—2 **4 Claims**



1. A vending machine for beverage containers comprising:

(a) a frame having front, side and rear faces;

(b) a bowed sign panel substantially covering the front face and extending outwardly therefrom, said sign panel being fabricated from transparent material and having translucent display fields formed thereon, said bowed sign panel having a substantially flat, central portion along the entire vertical length thereof and curved side portions extending from said flat portion to the side faces of said frame;

(c) illumination means disposed behind said bowed sign panel for backlighting the same, said illumination means including one elongated cylindrical light source disposed behind each curved side portion, said light source having substantially the same curvature as the curved side portions, the light sources extending vertically behind substantially the entire vertical length of the curved side portions, and an elongated, cylindrical light source extending vertically behind the flat, central portion of said sign panel for illuminating said central panel;

(d) a control panel disposed within the central portion of the bowed sign panel; and

(e) a discharge port for presenting said beverage containers to customers through said bowed sign panel.

4,682,710

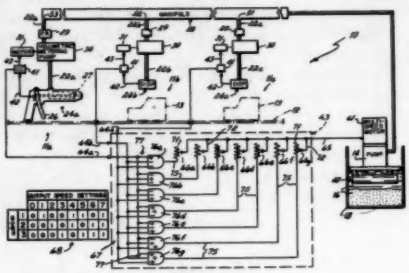
MULTI-STATION VISCOUS LIQUID DISTRIBUTION SYSTEM

Herman E. Turner, Jr., and Robert D. Glowacki, both of Elyria, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 15, 1986, Ser. No. 852,368

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—63 **20 Claims**



11. A system for dispensing multiple discrete streams of high viscosity liquids from a common liquid source comprising:

a distribution manifold,

a plurality of extrusion guns, each of said guns being independently operable to dispense said liquid in a stream onto a workpiece when activated,

a plurality of connector lines, each of said connector lines having an input end connected to said distribution manifold and a discharge end connected to a different one of said guns,

a multi-speed primary pump connected between said source and said distribution manifold for supplying said liquid to said distribution manifold at high pressure,

a motor and motor speed control means for effecting different discrete speeds of said multi-speed primary pump in response to each different combinations of guns activated at any time so that the dispensing rate of the guns remains substantially the same as different combination of guns are activated.

4,682,711

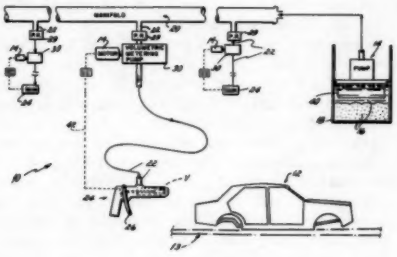
METHOD AND APPARATUS FOR SEALING WELDED SEAMS OF AUTOMOBILES

Alan B. Reighard, Hamburg, Mich., and Larry Soutar, Marietta, Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 8, 1985, Ser. No. 720,695

Int. Cl.[4] B67D *5/00*

U.S. Cl. 222—75 **8 Claims**



1. A system for dispensing viscous sealant material onto a welded seam of an automobile, which system comprises

a distribution manifold extending generally parallel to an automobile production line,

a plurality of extrusion guns,

a plurality of drop lines, each of said drop lines having upper ends connected to said distribution manifold and lower ends connected to one of said extrusion guns,

a primary pump for supplying sealant to said distribution manifold,

a plurality of volumetric metering pumps, one of said volumetric metering pumps being motor driven and operatively connected to each one of said drop lines so as to accurately control the rate of flow of sealant from said distribution manifold to one of said extrusion guns, and

a plurality of pressure regulators, one of said pressure regulators being located in each of said drop lines between said distribution manifold and one of said volumetric metering pumps.

4,682,712

DEVICES FOR THE PREPARATION OF A MIXTURE FROM AT LEAST TWO FLUIDS WITH A DEFINITE MIXTURE RATIO

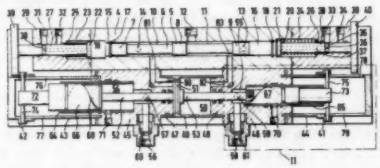
Franz Böhnensieker, Vom Stein-Strasse 27, D-4734 Harsewinkel, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,586

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343935

Int. Cl.[4] B67D *5/52*

U.S. Cl. 222—137 **7 Claims**



1. Device for the preparation of a mixture with a definite mixture ratio from a basic fluid and at least one additional fluid, with a metering arrangement consisting of a control unit to feed the pressurized basic fluid alternately to one or the other side of a main piston moving in a master cylinder between two limit positions, so that the main piston is moved from one limit position to the other limit position, thereby expelling a definite quantity of basic fluid from the master cylinder into a mixing vessel, and a connecting device to connect the main piston so at least one metering piston which moves in an associated metering cylinder with an inlet for the additional fluid and an outlet that connects with the mixing vessel and which is located between a position where the volume of the metering chamber formed in the metering cylinder is minimal and a position where the volume of the metering chamber formed in the metering cylinder is maximum, all in accordance with the movement of the main piston from one limit position to the other limit position, whereby movement of the metering piston in the direction increasing the metering chamber causes the additional fluid to be fed into the latter, whilst movement of the metering piston in the direction reducing the metering chamber causes the additional fluid collected therein to be expelled into the mixing vessel, and where the metering piston is arranged to slide axially between two adjustable limit positions on the connecting device in order to set the volume of the metering chamber, and

the connecting device comprises a piston rod which extends through the metering piston and which has one free end wherein one of the limit positions is defined by the interaction of a fixed stop element close to the outer end of the piston rod with a first stop face at the metering piston and the other limit position by the interaction of the outer end of the piston rod with a second stop face at the metering piston whose axial position is adjustable in relation to the first stop face.

4,682,713

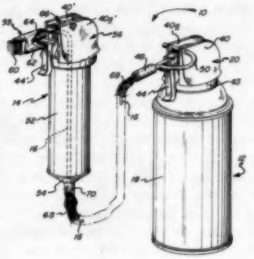
PRESSURIZED FLUID REMOTE-DISPENSER AND ASSEMBLY INCLUDING THE SAME

Clarence Clapp, Milford, Conn., assignor to Microcare Chemical Corporation, Farmington, Conn.

Filed Feb. 22, 1985, Ser. No. 704,376

Int. Cl.[4] B65D *83/14*; A46B *11/02*

U.S. Cl. 222—153 **14 Claims**



1. A pressurized fluid remote-dispensing assemsbly comprises a base unit defining a chamber containing fluid under pressure, a remote fluid dispenser and a flexible supply tube connecting the base unit and the remote dispenser in fluid flow communication;

(a) the base unit further comprising (i) release means having a discharge opening therein through which fluid is discharged from the base unit, (ii) a displaceable member component of a fluid supply valve assembly, said assembly being moveable with the displaceable member from a normally closed valve position to an open position in which the supply valve releases pressurized fluid from said discharge opening, and (iii) support means having therein a locking seat positioned adjacent the displaceable member;

(b) the supply tube having a supply end and a delivery end and being dimensioned and configured to have its supply end sealingly inserted into the discharge opening and its delivery end connected to the remote dispenser, the supply tube thereby serving to conduct fluid content of the base unit from the discharge opening thereof to the remote dispenser; and

(c) locking means secured to the supply tube adjacent the supply end thereof and dimensioned and configured to be releasably received within the locking seat to thereby retain the displaceable member and the fluid supply valve in its open position, and to be disengaged from the locking seat to release the displaceable member and the fluid supply valve for return to the closed valve position upon disengagement of the supply tube from the discharge opening.

4,682,714

NOZZLE CONSTRUCTION AND METHOD OF MAKING THE SAME

Chester W. Wood, Milford, Ohio, assignor to Dover Corporation, New York, N.Y.

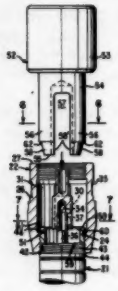
Filed Nov. 12, 1985, Ser. No. 796,817

Int. Cl.[4] B67B *5/00*; B21D *39/20*; F16L *13/14*

U.S. Cl. 222—153 **15 Claims**

1. In a nozzle construction for dispensing fuel and the like and comprising a spout member having opposed ends one of which is threaded, and an adaptor member having a threaded part threaded to said one end of said spout member whereby

said spout member and said adaptor member are disposed in a predetermined threaded condition thereof, said adaptor member having an opening means therein that defines an internal peripheral surface means thereof, part of said internal peripheral surface means comprising said threaded part of said adaptor member, said one end of said spout member being externally threaded and having been threaded into said opening means of said adaptor member to said predetermined threaded condition thereof, the improvement wherein one of said members has a portion thereof deformed into a locking position with the other of said members to tend to prevent relative threading movement between said members from said predetermined threaded condition thereof, said one member that has said portion thereof deformed into said locking position thereof comprising said spout member, said portion of said spout member that has been deformed into said locking position thereof comprising part of said one end thereof, said adaptor member having locking abutment means, said portion of said one end of said spout member having been deformed into said locking position so as to be adjacent said abutment means, said abutment means of said adaptor member having opposed shoulders respectively disposed substantially parallel with the longitudinal axis of said opening of said adaptor member, said portion of said one end of said spout member having been deformed so as to be in rotational alignment with said opposed shoulders, said one end of said spout member having a free peripheral edge means, said portion of said one end of said



spout member comprising part of said free peripheral edge means thereof, said free peripheral edge means having slit means on opposite sides of said abutment means, said portion of said free peripheral edge means comprising parts thereof defined in part by said slit means whereby a non-deformed portion of said free peripheral edge means is adjacent said abutment means and is disposed between said slit means.

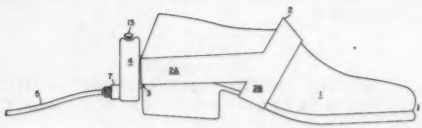
3. In a method of making a nozzle construction for dispensing fuel and the like and comprising the steps of providing a spout member that has opposed ends one of which is threaded, providing an adaptor member that has a threaded part, threading said adaptor member and said one end of said spout member together whereby said spout member and said adaptor member are disposed in a predetermined threaded condition thereof, forming said adaptor member to have an opening means therein that has opposed ends and that defines an internal peripheral surface thereof, forming part of said internal peripheral surface to comprise said threaded part of said adaptor member, and forming said one end of said spout member to be externally threaded whereby said step of threading causes said one end of said spout member to be threaded into one of said ends of said opening means of said adaptor member to said predetermined threaded condition, the improvement comprising the step of deforming a portion of one of said members into a locking position with the other of said members to tend to prevent relative threading movement between said members from said predetermined threaded condition thereof, said step of deforming said portion of said one member into said locking position thereof comprising the step of swaging said portion after said step of threading said members together to said predetermined threaded condition thereof, said step of swaging comprising the step of inserting a swaging tool in the other of said ends of said opening means and against said portion of said one member with a force that causes said portion of said one member to be swaged into said locking position thereof.

4,682,715

DETACHABLE SHOE-LURE DISPENSER

Richard R. Reeves, Star Rte. 1, Box 36A, Kinder, La. 70648

Filed Jul. 23, 1986, Ser. No. 888,520
Int. Cl.[4] B67D *5/64*; A01M *00/00*
U.S. Cl. 222—175 **5 Claims**



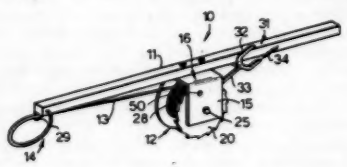
1. A detachable shoe accessory for dispensing animal lure directly onto the ground during walking activities comprising; a container for housing animal lure, said container having a means for regulating the flow of lure onto an elongated, flexible, absorbent applicator, said container molded so as to fit the heel of a shoe and constructed so as to provide a slotted wing extending along the front and on each side of the container through which the harness for attaching the container to the shoe is placed, said container also having a threaded female connector molded in the bottom and rear for attaching the applicator connector; a harness for attaching the accessory to the heel of a shoe, said harness being formed by straps made of elastic material; an elongated, flexible, absorbent applicator capable of communicating the minute amount of lure released from the container directly onto the ground during walking activities; an applicator connector, being a conduit having male threads for attaching to the container on one end and having male threads for attaching to the removable, tubular, storage cover on the other end, said applicator connector shaped so as to secure one end of the elongated, flexible, absorbent applicator by the insertion and a pin; and a removable, tubular cover or sheath of a size and shape to encase the said applicator during storage or non-use.

4,682,716

GRIPPING APPARATUS

Peter Morellini, P.O. Box 188, Ingham, Queensland 4850, Australia

PCT No. PCT/AU84/00261, § 371 Date Aug. 13, 1985, § 102(e) Date Aug. 13, 1985, PCT Pub. No. WO85/02807, PCT Pub. Date Jul. 4, 1985
PCT Filed Dec. 19, 1984, Ser. No. 774,590
Claims priority, application Australia, Dec. 19, 1983, PG2901
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—529 **3 Claims**



1. Apparatus adapted to be associated with a container of the type having a flexible discharge spout to control the discharge

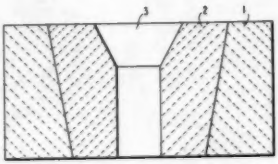
of granular material therefrom, said apparatus comprising an elongated member defining a handle portion at one end adapted to be gripped by one hand of a user, a flexible line having one end secured to the opposite end of said elongated member, said line passing freely through a guide at said opposite end of said elongated member to define a loop in said line adapted to be disposed in use about said discharge spout, a reel assembly supported on said elongated member intermediate the ends thereof, said reel assembly including a reel supported for rotation about an axis extending transversely of said elongated member, said line being secured at its opposite end to said reel so as to be wound in or let out upon rotation of said reel in opposite directions to thereby vary the size of said loop, biasing means associated with said reel and adapted to urge said reel to rotate in a first direction to wind in said line and thus reduce the size of said loop, a ratchet wheel fixed for rotation with said reel, a pawl assembly mounted adjacent said handle portion of said elongated member, biasing means associated with said pawl assembly to normally urge said pawl assembly into engagement with said ratchet wheel to prevent rotation of said reel in said first direction, said pawl assembly including an actuator portion located adjacent said handle portion so as to be releasably actuable by the hand of the user gripping the handle portion to effect controlled disengagement of said pawl assembly from said ratchet wheel so as to permit said reel under the influence of its biasing means to correspondingly rotate in said first direction to reduce the size of said loop and thereby selectively constrict in use the cross section of said discharge outlet of said container.

4,682,717

NOZZLES FOR CASTING ALUMINUM-KILLED STEELS

Emilio Marino, and Raffaele Mastromarino, both of Rome, Italy, assignors to Deltasider SpA, Piombino, Italy

Filed Jul. 6, 1984, Ser. No. 628,282
Claims priority, application Italy, Jul. 27, 1983, 48759 A/83
Int. Cl.[4] B22D *41/00*
U.S. Cl. 222—591 **2 Claims**



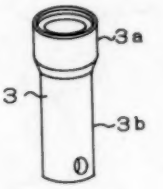
1. A nozzle for casting aluminium-killed steel, which is in two separate coaxial parts, the outermost of which consists essentially of a refractory material selected from the group consisting of zirconia and magnesite and having an axial cavity therethrough, the innermost part, housed in said cavity, being of calcium-oxide based refractory and having a passage therethrough for liquid steel and consisting essentially of between 90 and 99% (by weight) of calcium hydroxide with at least one compound selected from the metal oxides Fe_2O_3, Al_2O_3 and TiO_2 and the chlorides $CaCl_2$, NaCl and LiCl, in quantities between 1 and 10% by weight, said mixture being pelletized, dried at 100°–150° C. and then baked at 800°–1600° C. after which it is crushed, the crushed material then being further mixed with between 3 and 20% by weight of at least one compound selected from the metal oxides MgO, Fe_2O_3, Al_2O_3, TiO_2, ZrO_2, Cr_2O_3 and MoO_3 and the chlorides $CaCl_2$, NaCl and LiCl and with organic binder and carrier compounds selected from oil, paraffin, kerosene, lower alcohols and resins in quantites between 1 and 5% by weight.

4,682,718

NOZZLE FOR CONTINUOUS CASTING OF MOLTEN STEEL

Kuniaki Watanabe, and Hideo Suzuki, both of Tokyo, Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 523,914, Aug. 16, 1983, abandoned. This application Nov. 12, 1985, Ser. No. 797,369
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—591 **8 Claims**



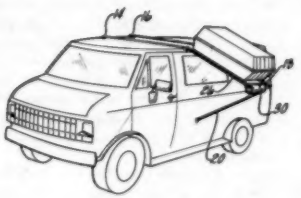
1. A nozzle for continuous casting comprising a fired unsintered body having a total volume and a minute cavities volume in the range of 0.1 to 0.25 of the total volume, said minute cavities comprising 6 to 60% closed pores, said closed pores comprising 1 to 10% of the total volume of the fired unsintered body, produced by the process of adding 2 to 30% by weight of silica powder to a primary mixture of 10 to 45% by weight of graphite powder uniformly dispersed in 40 to 88% by weight of alumina powder to obtain a secondary mixture, adding 2 to 30% by weight of a binder to the secondary mixture and kneading said secondary mixture and binder to obtain a final mixture, granulating said final mixture, molding said granulated final mixture in a rubber press to form a molded product, and firing the molded product at a temperature between 850° C. and 950° C. to decompose said binder into a gas to form said fired unsintered body with said closed pores while leaving unreacted alumina and silica in said fired unsintered body on surfaces of said closed pores.

4,682,719

VEHICLE TOP CARRIER

M. Eric Ernst, Grosse Pointe Park, and Walter L. Jewett, Huntingtonwoods, both of Mich., assignors to Pivot Manufacturing Company, Detroit, Mich.

Filed Jan. 30, 1984, Ser. No. 574,892
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—310 **8 Claims**



1. A vehicle top carrier comprising:

guide members rigidly mounted on top of the vehicle;

a carrier frame mounted on the guide members for movement from a generally horizontal transport position atop the vehicle to an inclined position displaced from the vehicle; and

a support arm assembly pivotally mounted at each of its terminal ends respectively to the carrier frame and to a vertical surface on the vehicle, the support arm assembly including means for shortening the effective distance

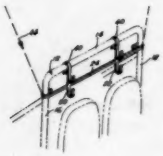
between the terminal ends of the support arm, thereby to produce a further inclination of the carrier frame.

4,682,720

GUN RACK

Charles C. Lucas, Rte. 7, Box 362, Meridian, Miss. 39301

Continuation of Ser. No. 687,824, Feb. 19, 1985, abandoned.
This application Oct. 16, 1985, Ser. No. 787,992
Int. Cl.[4] B60R *7/00*
U.S. Cl. 224—311 **2 Claims**



1. A gun rack particularly suitable for placement onto a roll bar of a vehicle, the roll bar having at least a horizontally disposed roll member supported intermediate a pair of vertically disposed support members, the gun-rack comprising:

a. a pair of rigid, vertically disposed frame members in parallel relation and extending to a distance upward at least to the height of the horizontally disposed roll member of the roll bar, each frame member having an upper end;

b. at least one rigid horizontally disposed mounting member intersecting and secured between and to the vertically disposed frame members, and having ends which extends out beyond each respective vertically disposed frame member a distance at least to each vertically disposed support member of the roll bar;

c. loop means contained on each end portion of the horizontally disposed frame member for loopingly engaging around each vertically disposed support member of the roll-bar, said loop means comprising a hook having an end formed on each respective horizontal member end;

d. loop means contained in the upper ends of the vertically disposed frame members for loopingly engaging the horizontally disposed roll member and supporting the gun rack therefrom, said loop means comprising a hook having an end formed on each respective upper end;

e. attachment means engaged on the end of the horizontally disposed member and comprising a hinge which allows it to pivot to the end of the hooks when the attachment means is in a first closed position and to disengage the ends of the hooks when the attachment means is in the open position; and

f. means extending from the vertically disposed frame member for mounting a weapon thereupon; and g. means for supporting guns.

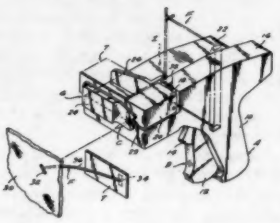
4,682,721

TAG DISPENSING AND ATTACHING APPARATUS

Daniel Duchin, Wantagh, L. I., N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 553,080, Nov. 18, 1983, Pat. No. 4,610,385.
This application Dec. 20, 1985, Ser. No. 811,902
Int. Cl.[4] B31F *7/00*
U.S. Cl. 227—67 **16 Claims**

1. Tag attaching apparatus, comprising: a housing including a manually engageable handle and means for mounting a stack of tags, actuating means disposed at the handle and mounted on the housing for movement relative to the housing, a hollow needle through which a fastener is dispensed, means for mounting the needle to the housing for movement between an original position and an extended position, means for moving a fastener through said needle including means for moving the needle mounting means from the original position to the extended position in response to actuation of the actuating means,



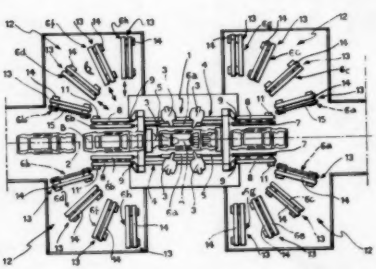
means for causing said fastener moving means to move the fastener through the needle in response to further actuation of the actuating means, wherein the means for moving a fastener through the needle includes a plunger movable between retracted and extended positions, means for feeding a fastener to the needle, and means for preventing operation of the fastener feeding means until the plunger has substantially completely returned to its retracted position.

4,682,722

WELDING SYSTEMS FOR MOTOR VEHICLES BODIES

Piero Bossotto, and Mario Brandino, both of Turin, Italy, assignors to Comau S.p.A., Italy

Filed Feb. 27, 1986, Ser. No. 834,215
Claims priority, application Italy, Feb. 28, 1985, 67213 A/85
Int. Cl.[4] B23K *37/04*
U.S. Cl. 228—41 **2 Claims**



1. System for welding motor vehicle bodies constituted by pressed sheet metal elements, adapted to operate automatically on at least two different types of body, comprising:

a welding station;

a conveyor line for conveying through the welding station a loosely preassembled motor vehicle body;

means for accurately positioning the underbody part of said loosely preassembled body precisely at said welding station,

a plurality of pairs of side gates on the two sides of the conveyor line;

a series of positioning tools carried by each pair of side gates for accurately positioning the various parts of the body relative to said underbody part, the positioning tools carried by each pair of side gates being adapted to the configuration of a corresponding type of body;

longitudinal guide means provided at the two sides of the

conveyor line, said side gates being movable parallel to the conveyor line on said longitudinal guide means into or away from an operative position to allow the rapid replacement of the pair of side gates located in said operative position at the welding station, in dependence on the type of body to be welded, each pair of side gates being also movable between a spaced apart condition for the introduction of the body to be welded to the welding station, and a relatively close condition in which the positioning tools engage the body and locate the various parts thereof in the welding configuration;

means for welding the body; and

a store of auxiliary pairs of side gates having positioning tools corresponding to further different types of body,

wherein the longitudinal guide means have separate end guide portions,

wherein movable support means are provided for carrying said end guide portions,

wherein the movable support means include gate-like support structures, each gate-like support structure being rotatable about a vertical axis between a first position in which the respective end guide portion is parallel to the conveyor line, so that it can receive a side gate when the latter is brought away from its operative position and a series of further positions for the transfer of the side gate to and from the store by the gate-like support structure,

wherein the store of auxiliary pair of side gates includes a series of fixed structures located adjacent to each gate-like support structure, for supporting the auxiliary side gates in substantially radial planes relative to the axis of articulation of the respective gate-like structure, each of said fixed structures having a guide member which is aligned with the guide portion of the respective gate-like support structure when the latter is located in the corresponding transfer postion, and

wherein each gate-like support structure is provided with means for rotating it about its articulation axis.

4,682,723

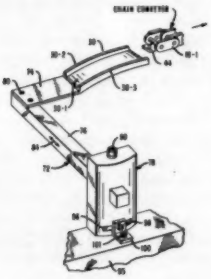
MASK FOR WAVE SOLDERING MACHINE

Dennis W. Grummett, Kitchener, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 16, 1986, Ser. No. 874,759

Int. Cl.[4] B23K *3/00*

U.S. Cl. 228—39 **12 Claims**



1. A wave soldering machine comprising:

a soldering station having means for presenting a wave of molten solder for soldering operations;

transporting means for transporting work to be soldered along a feeding line into operative contact with said wave of molten solder;

said work having at least one portion which is to be free of operative contact with said wave of molten solder as said work is moved through said soldering station by said transporting means;

a soldering mask; and

positioning means for positioning said soldering mask between said wave of molten solder and said one portion of said work;

said soldering mask having a general trough-like shape which displaces said wave of molten solder to enable said one portion of said work to be moved through said soldering mask and said soldering station free of operative contact with said wave of molten solder.

4,682,724

WELDING APPARATUS

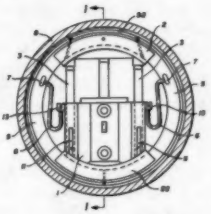
Helmut Hahn, 4096 Glanford Avenue, Victoria, British Columbia, Canada V8Z 4A2

Filed Sep. 8, 1986, Ser. No. 904,881

Claims priority, application Canada, Mar. 12, 1986, 502712

Int. Cl.[4] B23K *5/22*

U.S. Cl. 228—50 **20 Claims**



1. A welding backup shoe apparatus comprising:

a double-acting fluid cylinder having a piston rod extending from it;

a first retainer shoe attachable to the piston rod;

a second retainer shoe opposed to the first retainer shoe;

a first backup shoe to be received by the first retainer shoe;

at least two other backup shoes to be received by the first retainer shoe and by the second retainer shoe;

the backup shoe being arcuate externally to be a close fit within a pipe of a predetermined internal diameter;

guide means attached to the first retainer shoe, slidably engaging the second retainer shoe to guide the movement of the retainer shoes relative to each other;

release means attached to the cylinder to abut the first backup shoe; and

cables to attach the at least two other backup shoes to the cylinder.

4,682,725

PROCESS OF REPLACING A SLEEVE MOUNTED WITHIN A PIPE

Alain Martin, Lyons, and Philippe Maillard, Marcy l'Etoile, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed Mar. 7, 1985, Ser. No. 709,270

Claims priority, application France, Mar. 8, 1984, 84 03581

Int. Cl.[4] B23K *31/06*

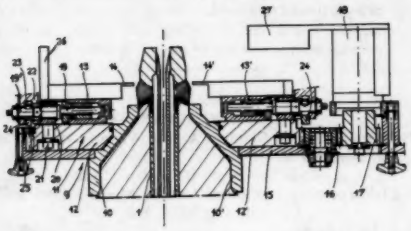
U.S. Cl. 228—119 **3 Claims**

1. Process of replacing a sleeve mounted within a pipe connected to an element (2) by one of its ends and having an internal wall to which said sleeve is welded at one of its ends, said sleeve being kept spaced from the internal wall of the pipe by blocks at its other end, comprising the steps of

(a) making a pair of cross cuts in said pipe (1, 1'), one at least of said two cross cuts being made in a part of said pipe situated opposite to the connection between said pipe and said element (2) with respect to the weld (5*a*, 5'*a*) of said sleeve (5, 5') onto said pipe (1, 1');

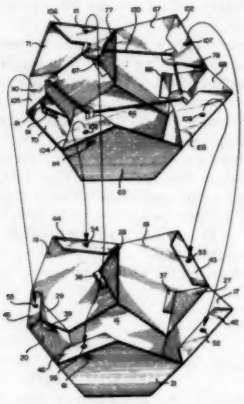
(b) removing both the resulting cut section of said tube and said sleeve (5,5');

(c) machining chamfers on free ends of said pipe (1, 1');
(d) checking the position and the geometry of said blocks (6, 6'); and
(e) welding to the chamfered edges of said pipe the corresponding ends of a new section of pipe, onto the internal



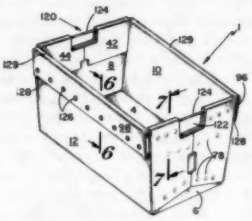
wall of which one of the ends of a new sleeve (5, 5') has previously been welded, said new sleeve having been machined in accordance with the position and the geometry of said blocks (6,6') as determined in step (d), so that there is miminum play between said blocks (6,6') and said free end of said sleeve (5, 5').

4,682,726
PENTAGONAL DODECAHEDRON
Fred Drueck, Jr., 4941 W. Henderson, Chicago, Ill. 60641
Filed Oct. 20, 1986, Ser. No. 920,686
Int. Cl.[4] B65D *5/36*
U.S. Cl. 229—108 **6 Claims**



1. A collapsible, self-erecting closed hollow structure in the form of a pentagonal dodecahedron formed from
a pair of integral blanks of paperboard each of which is cut and scored to form a pentagonal central wall having a pentagonal wall affixed to each of its respective side edges,
each of said pentagonal walls of one of said blanks having a foldable attachment flap integrally affixed to a radial edge thereof,
each of said pentagonal walls of the other one of said blanks having a foldable hook flap having a hook integrally formed therewith integrally affixed to a radial edge thereof;
said attachment flaps and said hook flaps being foldable to overlie its associated pentagonal flap,
means for securing the respective ones of said attachment flaps to said hook flaps for rotation therebetween when one of said blanks is disposed atop the other one of said blanks with said attachment flaps and hook flaps disposed between them,
elastic means secured under tension to said hooks of said hook flaps, said elastic means normally pulling said hook flaps toward one another and thereby erecting said closed hollow structure.

4,682,727
UTILITY TOTE CONTAINER
Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, Inc., Minneapolis, Minn.
Filed Mar. 4, 1986, Ser. No. 836,059
Int. Cl.[4] B65D *5/30*
U.S. Cl. 229—915 **7 Claims**



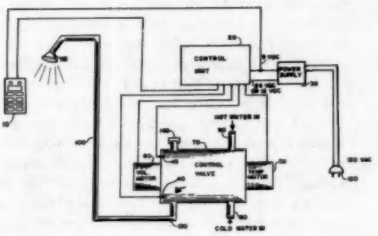
1. A material handling container comprising:
a receptacle portion formed from a single sheet of semirigid material which is cut, scored, and folded to form a generally rectangular base platform from which a pair of substantially upright opposed side walls and a pair of substantially upright opposed end walls extend, said side and end walls being hingedly connected to said base platform and defining an open top when folded to a generally upright position;
a pair of end panels at each end of said receptacle portion hingedly connected to the opposite ends of each of said side walls along generally vertically extending score line connections, each pair of said end panels being folded over the adjacent one of said end walls in abutting, parallel relation therewith;
a pair of foldover panels at each end of said receptacle portion hingedly connected to the upper ends of each of said end panels along score lines traversing the upper ends of each of said end panels, said foldover panels being folded downwardly and inwardly thereover with the surface of said foldover panels substantially parallel to the surface of said end panels and secured by attachment means to said end walls therebetween;
a pair of outer flaps defined by score lines extending lengthwise of said side walls adjacent the top extremities thereof and hingedly connected thereto, said outer flaps being folded downwardly to form upper stacking shoulders defined by said score lines along the top edges of said side walls; and
a pair of inner flaps defined by score lines extending lengthwise of the outer edges of said outer flaps and substantially parallel therewith and hingedly connected thereto, each said inner flap being folded upward between the outer flap to which said inner flap is connected and the adjacent side wall, to form lower stacking shoulders, whereby the lower stacking shoulders rest on said upper stacking shoulders when a plurality of said utility tote containers are nested one inside the other.

4,682,728

METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE AND FLOW RATE OF A FLUID

Martin S. Oudenhoven, 9436 W. Wesley Ave., Lakewood, Colo. 80227, and Frank Ruskey, 3510 Lee St., Wheatridge, Colo. 80033

Filed Aug. 27, 1985, Ser. No. 769,890
Int. Cl.[4] G05D 23/185
U.S. Cl. 236—12.12 8 Claims



1. An apparatus for a system including a source of cold water under pressure, a source of hot water under pressure, and a water outlet, for controlling the temperature and volume rate of discharge of water flowing out of said water outlet, said apparatus comprising:

data entry means for entering volume rate data indicating a desired volume rate and for entering temperature data indicating a desired temperature;

temperature sensing means for sensing the temperature of said flowing water and for producing a measured temperature signal indicative of the sensed temperature;

control means, responsive to said data entry means and said temperature sensing means, for producing a volume rate control signal in accordance with said volume rate data, and for producing a temperature control signal in accordance with said temperature data and said measured temperature signal;

a control valve means including a cold water port adapted to be connectable to said source of cold water under pressure, a hot water port adapted to be connectable to said source of hot water under pressure, and an outlet port adapted to be connectable to said water outlet, and connected to said control means, for mixing said hot and cold water in a predetermined ratio to form mixed water having said desired temperature in response to said temperature control signal and for permitting said mixed water to flow through said outlet port at a predetermined volume rate corresponding to said desired volume rate in response to said volume rate control signal, said control valve means comprising a mixing chamber; a first valve member in fluid communication with said hot water port, said cold water, and said mixing chamber, and arranged to admit hot water from said hot water port and cold water from said cold water port into said mixing chamber in said predetermined volume ratio according to an angular position of said first valve member; a first stepper motor responsively connected to said control means and mechanically coupled to said first valve member to control the angular position of said first valve member in accordance with said temperature control signal; a second valve member in fluid communication with said outlet port and said mixing chamber, and arranged to permit water mixed in said mixing chamber to flow from said mixing chamber to said outlet port at said predetermined volume rate according to an angular position of said second valve member; and a second stepper motor responsively connected to said control means and mechanically coupled to said second valve member to control the angular position of said second valve member in accordance with said volume rate control signal;

first means coupled to said first valve member for sensing the angular position of said first valve member and generating a first angular position signal indicative of the sensed angular position of said first valve member; and

second means coupled to said second valve member for sensing the angular position of said second valve member and generating a second angular position signal indicative of the sensed angular position of said second valve member,

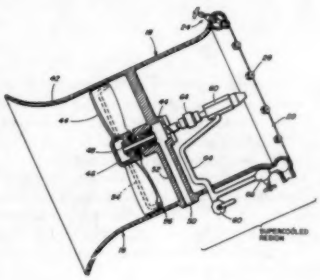
wherein said control means produces said temperature control signal further in accordance with said first sensed angular position and produces said volume rate control signal further in accordance with said second sensed angular position.

4,682,729

SNOWMAKING MACHINE WITH COMPRESSED AIR DRIVEN REACTION FAN

D. Mark Doman, and William R. Moss, both of Salt Lake City, Utah, assignors to The Dewey Electronics Corporation, Oakland, N.J.

Continuation-in-part of Ser. No. 740,738, Jun. 3, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,532
Int. Cl.[4] F25C 3/04
U.S. Cl. 239—2.2 11 Claims



1. A method for making snow which includes:

creating ice nuclei;

forming water droplets;

forming an airstream and flowing said airstream through a housing;

supercooling said airstream approximately 2° F. lower than ambient by the expansion of compressed air;

flowing the supercooled airstream into the water droplets and ice nuclei;

commingling in the supercooled airstream, the ice ncluei and the water droplets to form an ice nuclei-water droplet mixture;

discharing the mixture to ambient to form snow-like crystals.

4,682,730

DISTRIBUTOR OR DRIPPER FOR THE MICRO-IRRIGATION OF SOILS

Pierre A. Smeyers, Brussels, Belgium, assignor to Raymond J. Nakachian, Saudi Arabia, a part interest

Division of Ser. No. 580,998, Feb. 16, 1984, Pat. No. 4,623,094. This application Apr. 22, 1986, Ser. No. 854,623
Claims priority, application Belgium, Feb. 22, 1983, 210175
Int. Cl.[4] A01G 25/02; B05B 1/32
U.S. Cl. 239—109 25 Claims

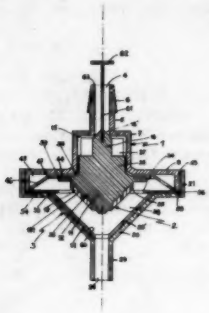
1. A distributor or dripper for the micro-irrigation of soils comprising:

a housing for an inner chamber, said chamber having a first

portion provided with an inlet for connection to a conduit of irrigation liquid and a first seat adjacent said inlet, and a second portion downstream of said first portion and provided with an outlet and a second seat adjacent said outlet, said second portion having a frusto-conical wall near the outlet;

a closing member which is movable in said chamber between at least a first position adjacent said first seat, a second position adjacent said second seat and a third position between said first and second positions;

first and second members disposed in said chamber, said first and second members being separated from one another in said first position of said closing member so that the irriga-



tion liquid in said chamber can freely flow toward the outlet, said first and second members meeting to form a filter which allows a flow of irrigation meeting to form a filter which allows a flow of irrigation liquid toward the outlet, but retains particles contained in said liquid, when said closing member is in its third position, and one of said first and second members flexing during movement of said closing member from said third position to said second position to allow movement of said closing member from said third position to said second position while maintaining said filter; and

means for returning said closing member to said first position when the pressure of the irrigation liquid is lower than a predetermined value.

4,682,731

EASY CLEAR SPRAY NOZZLE

John D. Bolton, 5 Shiloh Cir., Irvine, Calif. 92714

Continuation-in-part of Ser. No. 514,694, Jul. 18, 1983, abandoned. This application Feb. 1, 1985, Ser. No. 702,572

Int. Cl.[4] B05B *15/02*

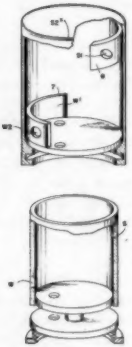
U.S. Cl. 239—119 **1 Claim**

1. An apparatus for unblocking a spray nozzle plugged with debris consisting of, in combination:

a fixed plate with a central axle, a first hole in said plate confluent with a source of pressurized spraying material,

an inner chamber, having an inner cavity, said inner chamber including a base plate, with a second hole therein intended to conduct pressurized spray material into the inner cavity of said inner chamber, said inner chamber base plated fixed on said central axle, and said inner chamber having a spray nozzle opening, and an opening intended to eliminate debris, characterized herein as a debris flushing outlet,

an outer chamber, including a base plate aligned on said central axle, and rotatably fixed to said axle, said outer chamber base plate having third and fourth holes intended to conduct pressurized spray material across the outer chamber base plate of said outer chamber, said outer chamber being substantially larger than said inner chamber, and more or less enclosing said inner chamber, there being a confluent space between said inner chamber, a cavity connecting upper and lower spaces defined by the inner chamber disposed in said outer chamber, said outer chamber having a plurality of inwardly projecting lands, exactly fitting to and sealing said inner chamber, thereby sealing off the openings for spraying and debris flushing when said lands are placed over those openings, and said outer chamber having an outer chamber port that is sealed from the central cavity by one of said inwardly projecting lands, but which permit material to pass out of said outer chamber, and wherein said hole and land are so placed that when the outer chamber is rotated over and around the inner chamber on the central axle, to one position, characterized herein as spray position, spray material passes through said first hole in the fixed plate, through said third hole in the base plate of the outer chamber, through said second hole in the base plate of the inner chamber, into the inner chamber cavity, through said inner chamber cavity, and out of said inner chamber through the spray nozzle opening, and to the outside through said outer chamber port, and in this position said fourth hole is out of alignment and does not permit spray material to enter or to pass through the space between the chambers, and the outer chamber has a port aligned over



said spray nozzle opening which permits said pressurized spray material to pass to the outside, and said debris flushing outlet is sealed off by an outer chamber inwardly projecting land which is placed over it by the rotation of said outer chamber into said spray and when said outer chamber is rotated on said axle, over and around the inner chamber, and left in a second position, characterized herein as debris flushing position, said first and fourth holes now align and said inwardly projecting land is moved off the said debris flushing outlet, and said debris flushing outlet is now aligned by said outer chamber port, thereby permitting material to escape to the outside, and said outer chamber encloses but does not block said inner chamber spray nozzle opening, and said pressurized spray material is forced through said first and fourth holes, into the space and cavity between the inner and outer chambers, and flows into the spray nozzle, taking debris with it and unblocking said spray nozzle opening, travels through and across the inner chamber cavity and out said debris flushing hole, and through said outer chamber port chamber to the outside, and in this said debris flushing position the holes designated as second and third holes are out of alignment and no pressurized spray material passes through them.

4,682,732
SPRINKLER WITH IMPROVED RISER SEAL

Joseph J. Walto, Chaska, Minn., assignor to The Toro Company, Minneapolis, Minn.

Continuation of Ser. No. 744,306, Jun. 13, 1985, Pat. No. 4,609,146, which is a continuation of Ser. No. 530,349, Sep. 8, 1983, abandoned. This application May 1, 1986, Ser. No. 857,985

Int. Cl.[4] B05B *15/10;* **F16J** *15/32*

U.S. Cl. 239—123 **7 Claims**

1. A sprinkler for sprinkling a liquid comprising:

a housing having a main body portion and a removable top, a hollow interior extending through said main body portion and removable top, and a seal element receiving area located adjacent its upper end;

a riser mounted in the hollow interior of said housing for reciprocating motion between an extended sprinkling position and a retracted non-sprinkling position, said riser having an exterior surface along its length and said housing having an interior surface at its upper end between which a gap is defined for permitting the reciprocating motion of said riser relative to said housing;

spring means for biasing said riser to said retracted position; and

a riser seal element comprised of an elastic material and being held in said seal element receiving area, an inner portion of said seal element extending into said gap to form a seal along a substantially line contact with said exterior surface of said riser for preventing the entry of extraneous material through the gap, said seal element making said line contact at a distance below the top surface of said removable top, said distance being approximately equal to the spacing of said gap, said inner portion of said seal element being flexible between an upwardly slanted normal position during which said line contact is made and a downwardly flexed position during the downward motion of said riser to wipe the exterior surface of said riser of extraneous material.

4,682,733
THRUST REVERSER

Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, London, England

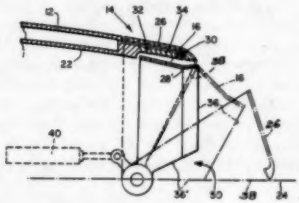
Filed Nov. 12, 1985, Ser. No. 797,017

Claims priority, application United Kingdom, Dec. 13, 1984, 8431556

Int. Cl.[4] F02K *1/62*

U.S. Cl. 239—265.39 **2 Claims**

1. A thrust reverser suitable for use on a gas turbine engine comprising a first pair of half doors and a second pair of half doors, said second pair of half doors having fully scarfed downstream edges, said first pair of half doors nesting within said second pair of half doors when non operative and having downstream edges which include relatively small scarfed portions, said first pair of half doors, when all of the half doors are in a non thrust reversing position, defining a greater portion of a nozzle throat with said small scarfed portions reducing side spillage of efflux, the first and second half doors being interconnected on a common axis for arcuate movement into positions where respective pairs abut each other along their scarfed edges and in operation on a gas turbine engine achieve reversal of the thrust therefrom without axial spillage of efflux.



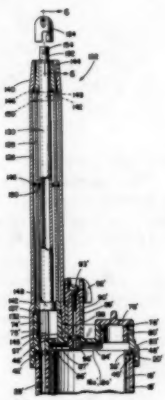
4,682,734
SPRAYING DEVICE HAVING CONTROLLED ADDITIVE FLUID FEED AND A TELESCOPING SPRAY TUBE ASSEMBLY

Rudy R. Proctor, Costa Mesa, and Fred M. Reinstein, Encino, both of Calif., assignors to Turbo Tek Enterprises, Inc., Los Angeles, Calif.

Filed Mar. 20, 1985, Ser. No. 713,824

Int. Cl.[4] B05B *7/26, 9/04;* **A62C** *31/02;* **E03B** *7/07*

U.S. Cl. 239—315 **34 Claims**



25. A hand-held telescoping spray tube assembly, which comprises:

an outer tube having a flow passage therethrough and having inner and outer ends;

at least one additional inner tube having a flow passage therethrough and having inner and outer ends, the inner tube being reciprocably mounted in the outer tube and being extendable outwardly relative to the outer tube;

surface means on the inner end of the inner tube responsive to pressure caused by fluid flowing through the tube assembly, to cause the inner tube to move in the outer tube outwardly relative to the outer tube;

movement limiting means on the outer end of the outer tube cooperable with the surface means on the inner end of the inner tube for limiting outward movement of the inner tube in the outer tube; and

an annular seal of circular cross section surrounding the

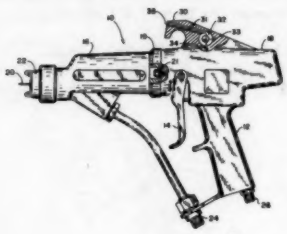
inner tube and disposed between opposed surfaces of the inner tube and the outer tube so that the seal rolls on the opposed surfaces of the outer tube and the inner tube as the inner tube reciprocates in the outer tube, with the seal being rollable into an intermediate position between the surface means on the inner tube and the movement limiting means on the outer end of the outer tube when the inner tube is retracted, and rollable against the movement limiting means when the inner tube is extended, said seal providing continuous fluid-tight sealing engagement between the inner tube and the outer tube throughout the reciprocating movement of the inner tube between its extended and retracted positions in the outer tube.

4,682,735

ELECTROSTATIC FIELD INDICATOR LIGHT FOR ELECTROSTATIC NOZZLES

Gordon V. Mommsen, Brooklyn Center, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Jun. 29, 1983, Ser. No. 508,887
Int. Cl.[4] G01R *29/12*; B05B *5/02*
U.S. Cl. 239—690 **13 Claims**



1. A light indicator apparatus for attachment to a high voltage electrostatic field generating device, comprising a two-terminal voltage breakdown gaseous light indicating means for generating light illumination in response to a predetermined voltage applied to one of said terminals, said light indicating means being attached to said device, one of said terminals being connected to the common voltage return path of said electrostatic field generating device, and the other of said terminals being unconnected, but having an end of said terminal physically positioned in the region of said high voltage electrostatic field.

4,682,736

EXTRACTOR IRRIGATION WOBBLE TUBE SYSTEM

Gregory J. Wieck, Chico Rte., Box 43, Enterprise, Oreg. 97828

Continuation of Ser. No. 216,541, Dec. 15, 1980, abandoned. This application Jan. 13, 1983, Ser. No. 457,654
Int. Cl.[4] B05B *3/18*
U.S. Cl. 239—736 **4 Claims**

1. An assembly for an irrigation system, said assembly comprising:

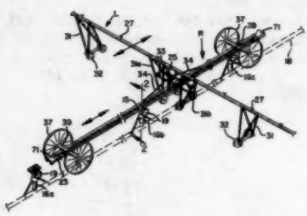
a standpipe adapted for connection to a supply of water,

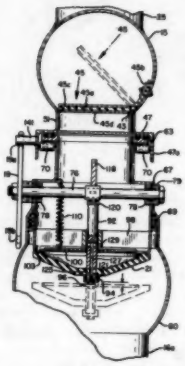
said standpipe having a stationary lower portion,

and having an upper portion with an upwardly facing outlet, valve means in said standpipe,

an extractor tube adapted to be carried along and to be brought into engagement with the upper portion of said standpipe for extracting water therefrom,

and common means for actuating said valve means and for supporting the upper portion of said standpipe on the lower portion in a manner to facilitate adjustable or adapt-





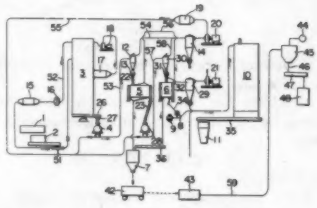
ive movement of said upper portion relative to said extractor tube.

4,682,737

METHOD AND APPARATUS FOR PREVENTING CLOGGING OF POWDERY GRANULES IN LIGHT POWDERY GRANULE TREATING SYSTEM

Kyushichi Ono, Higashine, Japan, assignor to Asahi Breweries Ltd., Tokyo, Japan

Division of Ser. No. 666,523, Oct. 30, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,140
Claims priority, application Japan, Jul. 30, 1984, 59-157644
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—34 **1 Claim**



1. An apparatus for treating hops, which comprises:

a first crusher for crushing hops, and a first motor for driving said crusher; a bucket conveyor connected to said first crusher for conveying crushed hops therefrom, and a second motor for driving said bucket conveyor; a hopper for receiving crushed hops from said bucket conveyor,

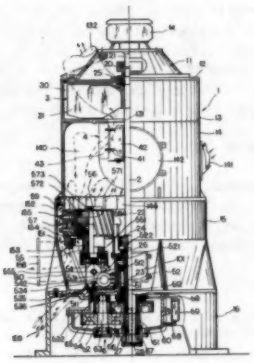
said hopper having a discharge opening at its lower end and a sloping wall extending upwardly from said discharge opening, said sloping wall being adapted to support a layer of crushed hops that moves therealong toward said discharge opening; a first limit switch associated with said hopper for controlling operation of said first and second motors, a first sensing lever connected to said first limit switch to actuate said first limit switch, a hollow ball connected to said first sensing lever, said ball being disposed close to said sloping wall for sensing the thickness of the layer of crushed hops thereon and causing said first sensing lever to actuate said first limit switch to turn off said first and second motors when the layer exceeds a predetermined thickness; a first screw feeder having an inlet connected to said discharge opening of said hopper for receiving crushed hops from said discharge opening, said first screw feeder having an outlet for discharging crushed hops therefrom; a first pneumatic conveyor connected to said outlet of said first screw feeder for conveying crushed hops from said first screw feeder and cooling said crushed hops; a storage tank and means connecting said storage tank to said first pneumatic conveyor so that said storage tank receives the crushed hops from said first pneumatic conveyor, said storage tank having an outlet at its lower end; a stirring device in said storage tank close to the outlet thereof, and a third motor for driving said stirring device; a second screw feeder having an inlet connected to the outlet of said storage tank for receiving crushed hops therefrom, said second screw feeder having an outlet for discharging the crushed hops, and a fourth motor for driving said second screw feeder; a first conduit extending downwardly from the outlet of said second screw feeder; a second limit switch associated with said first conduit for controlling operation of said third and fourth motors, a second sensing lever extending into said first conduit and connected to said second limit switch to actuate said second limit switch, a hollow ball connected to said second sensing lever and disposed inside said first conduit, so that when said first conduit becomes clogged with crushed hops, said second limit switch is actuated to turn off said third and fourth motors; a second crusher having an inlet and means connecting said inlet of said second crusher to said first conduit so that said inlet of said second crusher receives crushed hops from said first conduit, said second brusher being adapted for further crushing the hops; a second pneumatic conveyor connected to said second crusher for conveying crushed hops from said second crusher and cooling said crushed hops; a cyclone and means connecting said cyclone to said second pneumatic conveyor so that said cyclone receives the crushed hops from said second pneumatic conveyor and separates air therefrom, said cyclone having an outlet at its lower end; a second conduit connected to and extending downwardly from the outlet of said cyclone; a third limit switch associated with said second conduit for controlling operation of said third and fourth motors, a third sensing lever extending into said second conduit and connected to said third limit switch to actuate said third limit switch, a hollow ball connected to said third sensing lever and disposed inside said second conduit, so that when said second conduit becomes clogged with crushed hops, said third limit switch is actuated to turn off said third and fourth motors; a shaking sieve having an inlet and means connecting said inlet of said shaking sieve to said second conduit so that said shaking sieve receives crushed hops from said second conduit, said shaking sieve comprising means for separating the crushed hops into first undersize and first oversize fractions; a third crusher for crushing the first oversize fraction; a third pneumatic conveyor connected to said third crusher for conveying hops from said third crusher; a rotary sieve connected to said third pneumatic conveyor for receiving hops from said third pneumatic conveyor, said rotary sieve comprising means for separating said hops into second undersize and second oversize fractions; means for combining said first and second undersize fractions; a second storage tank for receiving the combined undersize fractions of the hops; a vacuum mucker and a vacuum pump therefor for drawing the combined undersize fractions from said second storage tank, a fifth motor for driving said vacuum pump, said vacuum mucker having an openable damper, said vacuum mucker having an outlet at its lower end; a third screw feeder having an inlet connected to the outlet of said vacuum mucker for receiving hops therefrom and having an outlet for discharging the hops; a third conduit connected to and extending downwardly from the outlet of said vacuum mucker; a fourth limit switch associated with said third conduit for controlling operation of said fifth motor, a fourth sensing lever extending into said third conduit and connected to said fourth limit switch to actuate said fourth limit switch, so that when said third conduit becomes clogged with crushed hops, said fourth limit switch is actuated to turn off said fifth motor; and a pelletizer for conveying the hops from said third screw feeder, and comprising means for pelletizing the hops.

4,682,738

GRINDING MILL

Shien F. Chang, 350 Fifth Ave., Ste. 2822, New York, N.Y. 10118

Filed Nov. 20, 1985, Ser. No. 799,904
Int. Cl.[4] B02C *23/28*
U.S. Cl. 241—56 **16 Claims**



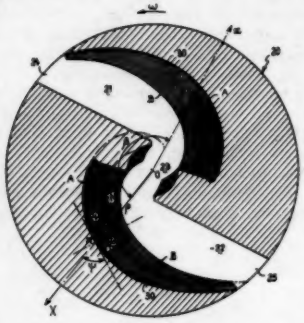
1. A grinding mill comprising a mill cylinder, a vertically mounted main shaft coupled at the upper end to a motor mounted atop the mill cylinder to be driven thereby and extending along the axis of the mill cylinder, and means mounted in descending order on the main shaft including a finished product conveying means, a classifying means, a grinding roller means and a decelerating means, a fixed sleeve fixed on the bottom of the mill cylinder to support a rotary bushing by means of bearings, a centrifugal device fixed to the upper end of the rotary bushing, a roller seat fixed likewise to the upper end of the rotary bushing and extending downwardly and radially, a plurality of roller shafts hinged at the lower end to the roller seat so as to pivot relative to the axis of the rotary bushing, and a corresponding plurality of grinding rollers detachably mounted on the upper end of each roller shaft.

4,682,739

DEVICE FOR PROJECTING SOLID PARTICLES FOR A VACUUM CENTRIFUGAL GRINDER

Gérard Sevelinge, Montceau les Mines, France, assignor to Framatome, Courbevoie, France

Filed Feb. 10, 1986, Ser. No. 827,586
Claims priority, application France, Feb. 15, 1985, 85 02234
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—275 **3 Claims**



1. Device for projecting solid particles for a vacuum centrifugal grinder, comprising a rotationally driven distributor wheel **(20)** for projecting at a high speed onto a target **(8)** a granular material introduced into a central feed chamber **(23)** placed on the axis of the said wheel, a plurality of channels **(21, 22)** being arranged within the wheel at right angles to its axis and opening outwards via ejection orifices **(24, 25)** onto the periphery of the wheel, producing the attachment of a single, uninterrupted stable self-protective layer **(30)** formed by the particles themselves over the entire length of said channel, wherein the face for guiding the particles in each channel **(21, 22)** has a curvature **(A)** extending in the direction of rotation of the distributor wheel **(20)**, and whose outline is calculated as a function of the friction coefficients of the materials in contact, and is determined so that the following formula

$$\Psi+\phi\geqq(\pi/2)$$

where Ψ determines the angle formed by the tangent to the curve and the vector radius at the point in question, and ϕ determines the angle whose tangent is equal to the friction coefficient, applies to any point of said curvature.

4,682,740

SHREDDER FOR LEAVES AND OTHER LIKE YARD AND GARDEN REFUSE

Anthony Conigliaro, Sherborn; Arthur St. Hilaire, Reading, and Sal G. De Yoreo, Andover, all of Mass., assignors to Armatron International, Inc., Melrose, Mass.

Filed Aug. 27, 1986, Ser. No. 901,047
Int. Cl.[4] B02C *18/12*
U.S. Cl. 241—282.1 **9 Claims**

1. A shredder comprising:

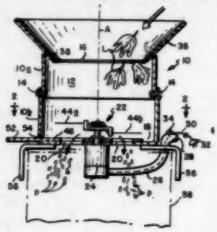
a container;

a shredding mechanism including a head mounted within said container for rotation about a vertical axis, said head having flexible elements extending radially outwardly therefrom;

motor means for rotatably driving said head to thereby cause said flexible elements to follow a rotational path;

said container being open at the top to define a loading port through which material may be received for shredding by said shredding mechanism, said loading port being arranged concentric to said vertical axis at a location directly overlying substantially the entire rotational path of said flexible elements; and

said container being closed at the bottom by a bottom wall having a discharge port therein through which the thus



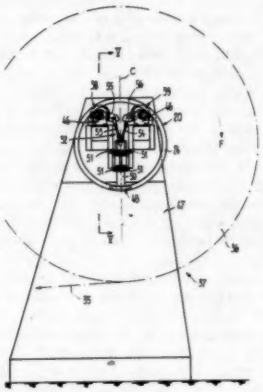
shredded material may be removed from said container, said discharge port being defined by a plurality of openings directly underlying the rotational path of said flexible elements and angularly spaced one from the other around said vertical axis.

4,682,741

APPARATUS FOR UNWINDING FLEXIBLE FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS, ARRIVING CONTINUOUSLY, ESPECIALLY IN IMBRICATED FORMATION

Werner Honegger, Tann-Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Division of Ser. No. 728,219, Apr. 29, 1985, Pat. No. 4,601,436.
This application Apr. 14, 1986, Ser. No. 852,721
Claims priority, application Switzerland, May 9, 1984, 2267/84
Int. Cl.[4] B65H *16/04, 75/02*
U.S. Cl. 242—55 **16 Claims**



1. An apparatus for unwinding flexible, substantially flat products, especially printed products, wound together with a winding strap into a wound package from such a wound package, comprising:

a substantially hollow and substantially cylindrical winding core;

a support arrangement for rotatably and releasably supporting said core;

said core being constructed as an annular friction wheel;

said annular friction wheel being structured for deposition upon and lifting from said support arrangement;

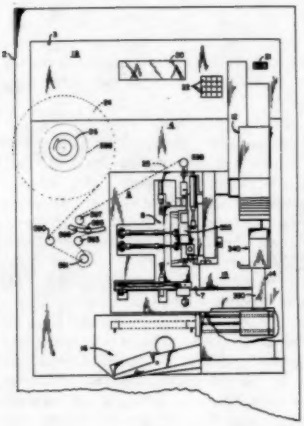
said annular friction wheel having an inner side and a longitudinal axis;
said annular friction wheel containing at said inner side a traction surface coaxial with said longitudinal axis;
said annular friction wheel comprising side flanges extending inwardly towards said longitudinal axis for laterally delimiting said traction surface;
said support arrangement comprising freely rotatable support wheels;
said traction surface bearing upon said freely rotatable support wheels; and
a braking member structured for operatively engaging said core.

4,682,742

APPARATUS AND METHOD FOR LOADING TAPE INTO A CASSETTE

George M. Woodley, Shrewsbury, Mass., and William S. Bakes, Somersworth, N.H., assignors to King Instrument Corporation, Westboro, Mass.

Filed Jan. 6, 1986, Ser. No. 816,629
Int. Cl.[4] B31F *5/06*; B65H *21/00*
U.S. Cl. 242—56 R **30 Claims**



1. A shift block assembly for use in splicing tape to leaders comprising:
means defining a fixed axis;
a first block mounted for rotational and axial movement on said axis;
a second block mounted for rotational movement on said axis;
a third block mounted for rotational and axial movement on said axis; and
first, second and third selectively operable tape holding means for holding a tape in position on each of said first, second and third blocks respectively.

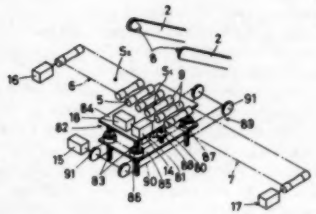
25. A shift block assembly for use in splicing tape to leaders comprising:
a shaft;
means mounting said shaft for rotational and longitudinal movement with respect to a fixed axis;
a first block rotatably and slidably supported by said shaft, said first block having a first guideway for receiving a first tape and means for holding said first tape in said guideway by suction;
a second block attached to said shaft so as to move therewith when said shaft rotates or shifts axially on said axis; said second block having a second guideway for receiving a second tape and means for holding said second tape in said guideway by suction;
a third block rotatably and slidably mounted on said shaft, said second block having a third guideway for receiving a third tape and means for holding said third tape in said guideway by suction;
means for selectively rotating each of said first and third blocks on said shaft between first and second predetermined limit positions;
means for selectively rotating said shaft and said second block between first and second predetermined angularly spaced limit positions; and
means for shifting said shaft axially between first and second axially-spaced shaft limit positions.

4,682,743

APPARATUS FOR AUTOMATICALLY MOUNTING A WEB ROLL ON A MILL ROLL STAND

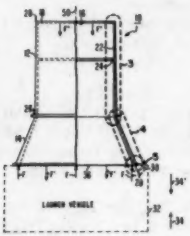
Masateru Tokuno, Nishinomiya; Tetsuya Sawada, Kyoto, and Yoshihiro Ishii, Yao, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Division of Ser. No. 642,719, Aug. 24, 1984, Pat. No. 4,586,673, which is a continuation of Ser. No. 431,086, Sep. 30, 1982, abandoned. This application Feb. 12, 1986, Ser. No. 829,092
Int. Cl.[4] B65H *16/06*, *19/30*
U.S. Cl. 242—58.6 **1 Claim**



1. An apparatus for automatically mounting a roll of web material on a mill roll stand having at least one pair of roll supports, said apparatus comprising:
a first driving means for moving said roll supports toward and away from each other,
a second driving means for moving said web roll in a vertical direction,
a third driving means for moving said web roll in a direction parallel to the axis of said roll supports,
a fourth driving means for moving said web roll in a direction transverse to the axis of said roll supports;
a first pulse generator for generating a signal which is proportional to the amount of rotation of said second driving means;
a second pulse generator for generating a signal which is proportional to the amount of rotation of said third driving means; and
a control means for providing signals to said first, second, third, and fourth driving means so as to control said third driving means on the basis of a comparison of the signal from said second pulse generator with the width of said web roll, and so as to move said web roll to a position halfway between but sideways of said roll supports, and so as to control said fourth driving means to move the web roll for a predetermined horizontal distance between the axis of the web roll and the axis of said roll supports, and simultaneously control said second driving means on the basis of comparison of the signals from said first pulse generator with the diameter of said web roll so as to move said web roll in a vertical direction, and so that the axis of said roll supports will be in alignment with the center hole in said web roll, and so as to control said first driving means so as to move said roll supports toward each other until they are inserted into said center hole of the web roll, wherein the web roll is supported by said roll supports.

4,682,744
SPACECRAFT STRUCTURE
Raj N. Gounder, Robbinsville, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Apr. 8, 1985, Ser. No. 720,941
Int. Cl.[4] B64G 1/10
U.S. Cl. 244—158 R **10 Claims**



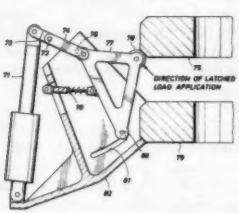
1. A spacecraft construction adapted to be attached to a launch vehicle comprising:

a tubular cylindrical structure; and

a tubular frustro-conical structure continuous with and extending from said cylindrical structure, said structures having aligned longitudinal axes;

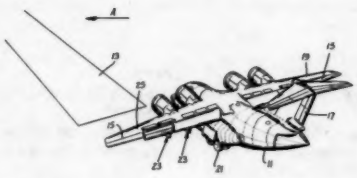
said structures being adapted to receive spacecraft payload and engine and comprising a continuous homogeneous microstructure formed of reinforcing fibers in a metal matrix, said microstructure having a wall thickness which increases from the extended end of said cylindrical structure remote from said frustro-conical structure to the extended edge of said conical structure remote from said cylindrical structure, the edge at the thickest wall end being adapted to be attached to said launch vehicle.

4,682,745
PRELOADABLE VECTOR SENSITIVE LATCH
William R. Acres, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 3, 1985, Ser. No. 783,888
Int. Cl.[4] B64G 1/64
U.S. Cl. 244—161 **14 Claims**



1. A preloadable vector sensitive latch, comprising: a housing, a main link slidably and pivotally connected directly to the housing, a yoke member, a free link directly connected to both the main link and the yoke member, and actuator means connected between the yoke member and the housing for changing the yoke position and for applying a force on the yoke to preload the latch.

4,682,746
CONTROL FORCE GENERATOR
Andrew S. W. Thomas, Marietta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.
Filed Dec. 5, 1984, Ser. No. 678,347
Int. Cl.[4] B64C 21/00, 5/06
U.S. Cl. 244—207 **1 Claim**



1. A control force generator for furnishing a control force for an aircraft having wings and at least one engine, the generator comprising:

(a) a source of compressed fluid;

(b) a pair of substantially symmetrical, spaced, aerodynamic surfaces forming a vane having a given chord length and span as well as leading and trailing edges, said vane being affixed beneath the wing of the aircraft substantially perpendicular thereto and being positioned so that the forward 25% vane chord passes approximately through the forward 35% chord of the wing;

(c) a fluid discharge slot for discharging the compressed fluid from the trailing edge of the vane;

(d) a plenum adjacent to the discharge slot for connecting the fluid discharge slot to the source of cmpressed fluid;

(e) a fluid control surface, positioned adjacent the fluid discharge slot, for forming first and second Coanda effect circulation control ports, each having a given width h, the control surface extending beyond the trailing edge of the vane and having a substantially rounded trailing edge forming a single Coanda surface with a given radius r; and

(f) control port selection means for selectively discharging the compressed fluid from the plenum to one of control ports, the control port selection means comprising:

(1) support means for rotatably supporting the fluid control surface for rotation about its longitudinal axis;

(2) a wedge-shaped sealing means for sealing a control port, the sealing means being affixed to the fluid control surface and positioned within the undivided plenum; and

(3) means for moving the fluid control surface about its rotational axis, so that when the control surface is rotated the wedge-shaped sealing means abuts one side of the plenum, and the sealing means forms a fluid seal with respect to the control port next to the side of the plenum abutted to permit discharge of the compressed fluid from the other port;

whereby the fluid discharged from a selected control port becomes attached to a portion of the Coanda surface adjacent the selected port and is deflected substantially tangentially to the Coanda surface resulting in a downstream deflection of the fluid flow through which the vane is traveling so that lift is produced by the aerodynamic surface adjacent the attached control port to provide a control force.

4,682,747

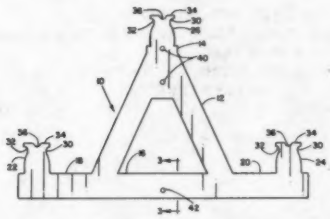
UTILITY INSULATED CROSS-ARM

Halm C. King, Jr., and Nancy King, both of Star Rte. 2, Box 43J, Hwy. 90 W., Del Rio, Tex. 78840

Filed Apr. 24, 1986, Ser. No. 855,836

Int. Cl.[4] F16L 3/22

U.S. Cl. 248—68.1 18 Claims



1. A utility insulated cross-arm for supporting electrical wires from a utility pole comprising:

a triangular frame having a base and a peak, said triangular frame being constructed from an insulative material;

left and right horizontal cross-arms integral with said triangular frame and constructed from an insulative material, located at the base of said triangular frame, said horizontal cross-arms each having an upper surface;

an upper support member integral with and located at said peak of said triangular frame and constructed from an insulative material;

attachment means for attaching said electrical wire to said upper support member; and

mounting means for mounting said triangular frame to said utility pole, said mounting means comprised of a plurality of holes located along a vertical centerline of said triangular frame, for bolting said triangular frame to said utility pole.

4,682,748

ONE-PIECE CLIP-SHAPED HOLDER FOR ELONGATED ARTICLES

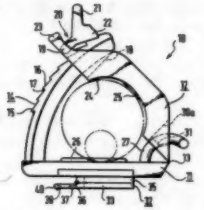
Kurt Freudenmann, and Heiner Wiese, both of Hamburg, Fed. Rep. of Germany, assignors to ITW Ateco, Norderstedt, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,420

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445935

Int. Cl.[4] F16L 3/12

U.S. Cl. 248—73 5 Claims



1. A one-piece clamp device for fixing elongated articles comprising:

a base portion having a means for connecting said base portion to a support member on one side thereof;

an upstanding bracket located on the side opposite to said one side of said base portion and at one end thereof;

a first hinge means for continuously pivotally connecting said upstanding bracket to said one end of said base portion;

an upstanding toothed member integral with said base portion on its side opposite said means for connecting at its end opposite said bracket having several teeth integrally formed on one of its sides;

means for engaging said teeth on the distal end of said bracket; and

a second auxiliary hinge means for continuously pivotally connecting said bracket to said one end of said base and for providing a fixed stop of said bracket in its open position.

4,682,749

ADJUSTABLE COPYHOLDER WITH ARTICULATED ARMS

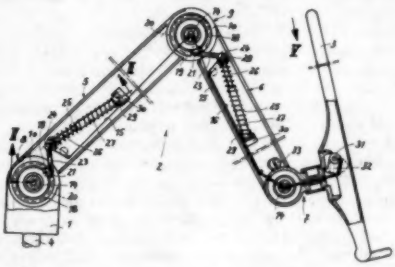
Fritz Sträter, Unterm Bamberg 1, D-5882 Meinerzhagen, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,452

Claims priority, application European Pat. Off., Oct. 28, 1985, 85113678.8

Int. Cl.[4] E04G 3/00

U.S. Cl. 248—284 18 Claims



14. A copyholder for flat sheets comprising a base rotatable about a vertical axis:

an articulated arm swingably mounted on said base at a first horizontal axis defined by a pivot joint, said arm having two segments connected pivotally together at another pivot joint having a second horizontal axis, each of said pivot joints comprising:

inner and outer parts coaxial with one another at the rspective axes and relatively rotatable,

an arc-segmental brake shoe disposed between said parts and formed as an interrupted ring having opposing ends,

a spreader between said opposite ends of said shoes and mounted on said inner part for rotation between positions in which said ends are spread apart to urge said brake shoes against said outer part and in which said ends approach each other when said brake shoes are released from engagement with said outer part; and

spring means for biasing said spreaders into said position wherein said ends are spread apart;

a copy support plate pivotally connected to said arm at an end thereof furthest removed from an end of said arm mounted on said base;

a handle on said plate; and

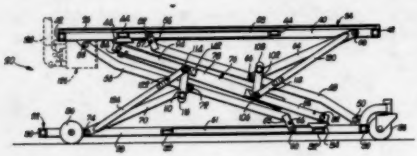
at least one traction element operatively connected to said handle and to said spreaders for rotating said spreaders against the force of said spring means to disengage said brake shoes from the respective outer parts.

4,682,750

LOW PROFILE EXTENSIBLE SUPPORT PLATFORM

Steven M. Rudolph, David City, and Donald J. Maxwell, Lincoln, both of Nebr., assignors to Eidos Corporation, David City, Nebr.

Filed Sep. 26, 1986, Ser. No. 913,008
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—421 9 Claims



1. A low profile extensible support platform assembly comprising:

a base extending generally in a reference plane;

platform means extending generally in a plane substantially parallel to said reference plane and defining a work supporting surface;

a first pair of spaced linkages each pivotally connected to said base and shiftably coupled to said platform means;

a second pair of spaced linkages each pivotally connected to said platform means and shiftably connected to said base, each of said first pair of linkages and each of said second pair of linkages being elongated and presenting an intermediate region;

a first pair of link means each pivotally coupled to said intermediate region of one of said first pair of linkages and each pivotally connected to said platform means;

a second pair of link means each pivotally coupled to said intermediate region of one of said second pair of linkages and each pivotally connected to said base,

said first pair of linkages during shifting movement along said platform means and said second pair of linkages during shifting movement along said base being swingable in an arc about said base and said platform means respectively for moving said platform means either toward or away from said base while retaining said platform means in substantially coplanar relationship with said base as said first pair of link means swings in an arc about said first pair of linkages and said platform means and as said second pair of link means swings in an arc about said second pair of linkages and said base;

extensible means having a first end portion and a second end portion selectively movable along an axis toward and away from said first end portion;

an elongated swivel member pivotally coupled to one of said end portions of said extensible means for swinging movement about the latter;

torque arm means pivotally interconnecting said swivel member and an adjacent pair of one of said first and second pairs of link means;

said torque arm means being positioned to exert a torque on an adjacent pair of said link means as said second end portion of said extensible means is moved away from said first end portion of said extensible means to exert tension on said swivel member and thereby said torque arms means, and to cause said first link means and said second link means to swing in an arc about said first pair of linkages and said second pair of linkages respectively; and

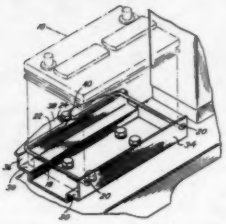
stop means connected to one of said platform means and said base and engageable with one of said second end portion and said first end portion of said extensible means respectively for supporting said extensible means during engagement therewith and for opposing rotation of said extensible means about an axis transverse to its axis of extensible movement as said second end portion of said extensible means is moved away from said first end portion, to thereby simultaneously increase the tension on said swivel member and assist said torque arm means in exerting a torque on said adjacent pair of link means, and for simultaneously causing said first pair of linkages and said second pair of linkages to swing about said base and said platform means correspondingly to move said platform means away from said base as may be desired.

4,682,751

BATTERY MOUNTING DEVICE

Attila J. Tamas, Portage, Mich., assignor to Clark Equipment Company, South Bend, Ind.

Filed Mar. 3, 1986, Ser. No. 835,482
Int. Cl.[4] A47B 97/00
U.S. Cl. 248—503 11 Claims



1. A battery mounting device for vehicles having a battery case with at least one transversely extending projection at each of two opposed sides thereof, said projections being near the bottom of said battery case, comprising a support tray supporting said battery case and adapted to be secured to a rigid member, said support tray including two only upwardly extending operative flanges, said operative flanges being located at the other opposed sides of the battery case and adapted to support said other opposed sides, and a U-shaped member surrounding said battery case on three sides thereof and engaging one of said battery tray flanges at the open side of said U-shaped member, said battery case projections being engaged by the legs of said U-shaped member, the other of said flanges having a ledge means, and means adapted to connect the base of said U-shaped member to said ledge and being adjustable to rigidly engage said U-shaped member with said battery case and said support tray.

4,682,752

HOLDING FIXTURE FOR A PIPE-LINE

Bruno Pischzik, Randpark North, South Africa, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 799,094
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443648; May 13, 1985, 3517688
Int. Cl.[4] F16L 3/20
U.S. Cl. 248—550 11 Claims

1. A holding fixture for a pipe-line, said holding fixture comprising:

(a) a thermally conductive base (34) which, in use, is in thermal contact with a pipe-line (1) extending in a first direction;

(b) a first mounting (35) projecting from a first point on said thermally conductive base (34);

(c) a second mounting (38) projecting from a second point on said thermally conductive base (34);

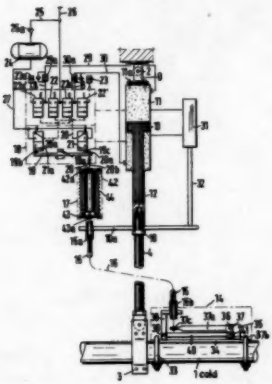
(d) a control rod (40) having a first end pivotally mounted (39) on said second mounting (38) and a second end, said control rod (40) extending at least substantially in said first direction and being at least substantially thermally isolated from the pipe-line (1) during use of said holding fixture;

(e) an angle lever (37) having a fulcrum (36) pivotally

mounted on said first mounting (35), a first arm (37*b*) that is pivotally connected to said second end of said control rod (40), and a second arm (37*a*), whereby said angle lever (37) pivots about its fulcrum (36) in response to torque exerted on said first arm (37*b*) due to thermally induced changes in the distance between said first and second points on said thermally conductive base (34);

(f) a first Bowden cable 16 having a first end attached to said second arm (37*a*) of said angle lever (37) and a second end;

(g) a tilting lever (19) having a fulcrum (19*a*) that is fixed relative to said thermally conductive base (34) and at least one arm that is pivotable relative to said fulcrum (19*a*) and



that is connected to said second end of said first Bowden cable (16);

(h) first means (11,12,13) for moving the pipe-line (1) back and forth in a direction perpendicular to said first direction;

(i) second means (21) for causing said first means (11,12,13) to move the pipe-line (1) in a first way in response to an angular movement of said tilting lever (19) in a first sense; and

(j) third means (21*a*) for causing said first means (11,12,13) to move the pipe-line (1) in a second way in response to an angular movement of said tilting lever (19) in a second sense.

4,682,753

VIBRATION ABSORBING MOUNTINGS

Michael Clark, Coventry, England, assignor to Dunlop Limited, United Kingdom

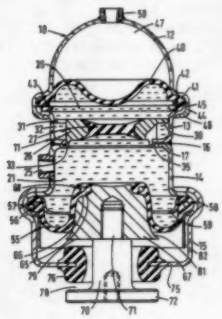
Filed Oct. 29, 1984, Ser. No. 665,945

Claims priority, application United Kingdom, Nov. 12, 1983, 8330254; Aug. 3, 1984, 8419910

Int. Cl.[4] F16F *13/00*

U.S. Cl. 248—562 **6 Claims**

1. A vibration absorbing mounting comprising a reinforced elastomeric rolling-lobe end diaphragm sealed to a housing and a piston engaging the central region of the end diaphragm, the housing comprising a pair of liquid-filled chambers which communicate with one another through a restricted passageway and which are separated from one another by an intermediate elastomeric diaphragm of sufficient thickness to provide substantial spring stiffness, a first chamber of said liquid-filled chambers being adjacent the end diaphragm, and a second of said liquid-filled chambers being bounded at one side by the said intermediate elastomeric diaphragm and at the other side by a separator diaphragm, the housing also comprising a gas chamber for containing gaseous pressure arranged to act on the



side of the separator diaphragm remote from the second liquid-filled chamber.

4,682,754

TURBINE PEDESTAL

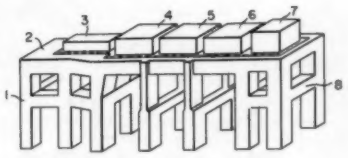
Sakae Ebata, and Nobuaki Ohshima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,838

Claims priority, application Japan, Apr. 3, 1981, 56-49454

Int. Cl.[4] F16M *11/00*

U.S. Cl. 248—639 **12 Claims**



1. A turbine pedestal comprising a deck and a plurality of posts for supporting the deck which in turn supports turbines and a generator, wherein the improvement resides in that:

said posts each include an outer tubular frame formed of concrete reinforcing steel plate, and concrete deposited on the inner side of said outer frame so that said plates are a substantial part of the design concrete reinforcement of said posts; and

a foundation including a plurality of steel plates arranged parallel to each other in predetermined spaced relation in horizontal planes, said outer frame of each post being firmly secured to each of two of said steel plates, and a plurality of vertically extending spacer elements secured between the steel plates.

4,682,755

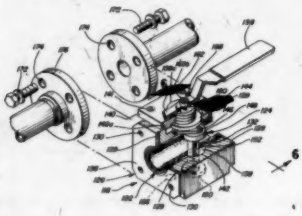
MECHANICAL CONTROL SYSTEM IN FLOW DEVICES

Robert E. Bernstein, Framingham, and Alan E. Nelson, Franklin, both of Mass., assignors to Larad Equipment Corporation, Medfield, Mass.

Continuation-in-part of Ser. No. 769,783, Aug. 23, 1985, Pat. No. 4,630,635, which is a continuation of Ser. No. 441,613, Feb. 11, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,038

Int. Cl.[4] F16K *31/524;* F16L *55/14*

U.S. Cl. 251—4 24 Claims



1. A pinch valve for use in a conduit system comprising:

a hollow housing having openings at opposite ends;

an elongated sleeve disposed inside said housing and defining a fluid flow path, said sleeve having a longitudinal axis generally parallel to such fluid flow path; and

a mechanical valve actuating device, said device including a first pinch member and a second pinch member, said pinch members disposed within said housing at opposite sides of said sleeve, at least of said pinch members including a rotatable drive element and a shank, said rotatable drive element being rotatable about an axis of rotation which is transverse to and offset laterally from said longitudinal axis, said shank being disposed beside said sleeve and eccentrically attached to the respective drive element for movement transverse to said sleeve along an arcuate path as that drive element is rotated for pinching and releasing the sleeve; said one of said pinch members being mounted such that said shank moves generally normal to said sleeve as it begins pinching of said sleeve and then along such an arcuate path which becomes generally parallel to the axis of said sleeve as the sleeve is closed thereby;

whereby the transverse pinching movement of said shank decreases relative to the rotational movement of said drive element as said sleeve is pinched by said one of said pinch members.

4,682,756

HYDRAULICALLY OPERATED SELF-CLOSING TWO-WAY SEAT-TYPE VALVE

Manfred Härtwig, Ostfildern, and Georg Rausch, Lohr, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jul. 15, 1986, Ser. No. 886,541

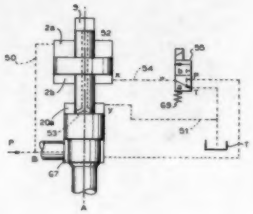
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525331

Int. Cl.[4] F16K *31/122*

U.S. Cl. 251—63.5 2 Claims

1. In a hydraulically operated self-closing two-way valve, particularly a built-in valve, comprising a housing (**15**) having an inner opening and a valve seat at said inner opening; a piston-shaped loacking body (**12**) received in said opening and cooperating with said vlave seat and having a guide portion (**12***a*) and a seat portion (**21**), said guide portion being of greater diameter than that of said seat portion; a cover (**1**) mounted on said housing and having a recess; a hydraulically loadable actuating piston (**3**) received in said recess and being operative for actuating said locking body, said actuating piston being of diameter greater than that of said guide portion (**12***a*), said actuating piston having, at a side thereof which faces away from said closing body, a piston-shaped extension (**5**) which is guided in said cover and limits in said cover a chamber (**9**), said locking body having between said guide portion and said seat portion a ring-shaped surface (**60**), said actuating piston having at a side thereof facing away from said locking body, a circular surface (**62**), said ring-shaped surface and said circular surface being loaded with a pump pressure, said actuating piston further having at a side thereof facing said locking body a surface (**63**) which is selectively loadable with a pump pressure or a low pressure, the improvement comprising:

(a) said actuating piston having at the side thereof facing said locking body an additional piston-shaped extension (**4**) which is connected to said locking body in a locking fashion;



(b) a separation wall (**6**) formed between said piston and said locking body, said additional extension being guided in said separation wall;

(c) said additional extension limiting between said locking body and said separation wall and said chamber (**9**) a further chamber (**20***a*) which is loaded with the pressure lower than the pump pressure;

(d) said piston-shaped extension and said additional extension being of the same diameter and having a common axial bore (**52**) also extending through said piston; and

(e) said additional extension having radial bores (**53**) connected to said axial bore while said axial bore and said radial bores connect said further chamber (**20***a*) with said chamber (**9**).

4,682,757

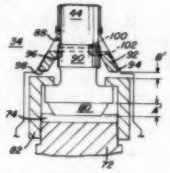
SECONDARY BACKSEAT FOR GATE VALVE

William S. Shelton, Houston, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jul. 18, 1986, Ser. No. 886,695

Int. Cl.[4] F16K *41/14*

U.S. Cl. 251—77 25 Claims



1. A gate valve comprising:

a valve body having a flow passage extending therethrough and a valve chamber intersected by the flow passage;

a valve closure element slideably mounted within the valve chamber for movement between open and closed positions relative to the flow passages;

a bonnet assembly secured to said valve body having a central bore communicating with the valve chamber, the central bore having a longitudinal axis and a coaxial frus-

to-conical counterbore portion adjacent the valve chamber providing a bonnet backseat surface;

a valve stem connected to said valve closure element and extending coaxially through the central bore of said bonnet assembly, said valve stem being axially movable to move for said slideably-mounted valve closure element between open and closed positions of the fluid flow passages of the gate valve;

means for backseating said valve stem on the bonnet backseat surface in response to axial movement of said valve stem, said backseating means including a metal seal ring having a frusto-conical outer sealing surface, the metal seal ring being slideably mounted on said valve stem within the valve chamber, the slideable seal ring having a first axial position on said valve stem whereby initial contact is made between the seal member and said bonnet backseat portion in response to axial movement of said valve stem, the slideable seal ring being movable to a second axial position on said valve stem in response to further axial movement of said valve stem to establish a metal-to-metal seal between said valve stem and said bonnet assembly; and

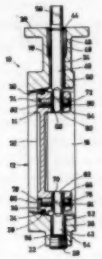
means for repositioning the metal seal ring from the second axial position to the first axial position about said valve stem in response to opposite axial movement of said valve stem.

4,682,758

DISK/STEM CONNECTION APPARATUS FOR BUTTERFLY VALVE

William B. Scobie, and Michael L. Wagberg, both of Houston, Tex., assignors to Keystone International, Inc., Houston, Tex.

Filed Mar. 5, 1986, Ser. No. 836,541
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—84 **19 Claims**



1. A valve comprising:

a valve body defining a flow passage therethrough and an annular seat in surrounding relationship to said flow passage;

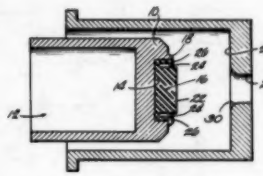
a closure assembly mounted within said valve body for movement between open and closed positions to control the flow of fluid through said passage, said assembly comprising at least one valve stem rotatably mounted in said housing and extending into said passage along a diameter thereof, a closure element having a circumferential profile matable with said annular seat, and means for mounting said closure element on said at least one valve stem including at least one hub fixed to said closure element and defining a bore receiving said at least one valve stem therein, at least two threaded passages intersecting said bore in general opposition, and at least two threaded members each threadedly received in a respective one of said passages to engage from opposite sides of said stem whereby adjusting said threaded members changes the relative positioning of said closure element with respect to said valve stem and said valve seal.

4,682,759

RELIEF VALVE FOR HYDRAULIC SYSTEMS

Charles B. Hall, Ingleside, and Martin J. Mondek, Wonder Lake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 20, 1983, Ser. No. 543,947
Int. Cl.[4] F16K *1/36*
U.S. Cl. 251—210 **7 Claims**



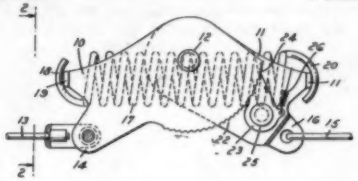
1. A valve assembly comprising a valve member including a face having therein a cylindrical cavity, said face defining an annular ring around said cavity, and a soft rubber seal member fixed in said cavity, said seal member being generally in the form of a solid geometric cylinder having an end face with a central portion which projects axially beyond said annular ring and has a flat circular sealing surface, with an outer annular portion having a surface in approximately the same plane as said annular ring, and with an annular slot between said central portion and said outer annular portion permitting deflection of said seal member into the space otherwise defined by said slot.

4,682,760

CONSTANT FORCE CABLE SELF ADJUSTING DEVICE

John M. Baumgarten, Saline, Mich., assignor to Acco Babcock Inc., Fairfield, Conn.

Filed Sep. 18, 1986, Ser. No. 909,220
Int. Cl.[4] B21F *9/10*; B60G *11/14*; F16C *1/22*
U.S. Cl. 254—199 **3 Claims**



1. A constant force self adjusting cable control device comprising

a first member and a second member pivoted to one another about a pivot point,

a tension spring connected to the first and second members and yieldingly urging the first and second members in a direction to cause movement about the pivot point,

a cable attached to each of the first and second members, said cables being axially aligned such that the axis of the tension spring and the axis of the cables are parallel,

the angular displacement between the points of attachment of the spring and the cable on one member and the pivot point forming an angle equal to the angle of the point of attachment of the spring and the cable of the other member and the pivot point whereby substantially constant tension is provided on each of the cables, and

a one-way latch which automatically releases when there is any slack in the cables thereby permitting relative movement between the two members until the tension on the cables is re-established.

4,682,761

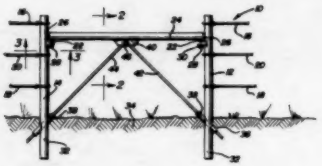
CORNER AND IN-LINE FENCE POST STRESS AND BRACING SYSTEM

Robert L. Hanneken, Box 110, Rte. 1, Verona, Mo. 65769

Filed Sep. 4, 1985, Ser. No. 772,523

Int. Cl.[4] E04H *17/02*

U.S. Cl. 256—36 **9 Claims**



1. A fence construction comprising a pair of spaced apart, upright fence posts having upper and lower end portions, an outer surface and their lower end portions embedded in the ground, an upper horizontal brace extending between and anchored to the upper end portions of said posts at an elevation spaced appreciably above the ground, a pair of guide members mounted to said posts at generally ground level, a pair of elongated, longitudinally straight and oppositely inclined braces extending between a longitudinal mid-portion of said horizontal brace and said guides with the lower ends of said inclined braces guidingly engaged with said guide members for longitudinal shifting thereto and projecting downwardly and outwardly from said outer surface and into the ground and the upper ends of said inclined braces anchored to the longitudinal mid-portion of said horizontal brace, said guide members and the lower ends of said inclined braces including locking means releasably securing said lower ends of said inclined braces in a relative position with said guide members.

4,682,762

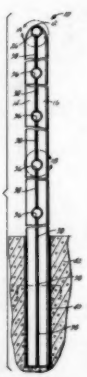
FENCE SYSTEM WITH ONE-PIECE POSTS

Carl W. Lekavich, 1645-3 W. Sepulveda, Torrance, Calif. 90501

Continuation-in-part of Ser. No. 495,438, May 17, 1983, abandoned. This application Apr. 18, 1984, Ser. No. 601,109

Int. Cl.[4] E04H *17/14*

U.S. Cl. 256—65 **35 Claims**



1. A one-piece fence post comprised of a rigid tubular member folded in a region between its ends to form first and second longitudinally abutting portions, a first pair of inwardly facing adjacent indentations formed in the respective first and second portions in the folded region to define a first transverse rail-receiving passage, a second pair of inwardly facing adjacent indentations formed in the respective first and second portions between the folded region and the ends of the member to define a second transverse rail-receiving passage, and means for directly attaching the first and second abutting portions together.

4,682,763

FLEXIBLE MOUNTING

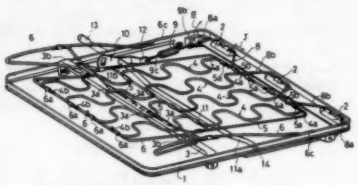
Kenichi Kazaoka, Nagoya; Hiroshi Okazaki, Toyota, and Yasuhisa Inaba, Handa, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 25, 1985, Ser. No. 715,403

Claims priority, application Japan, Mar. 26, 1984, 59-59094; Mar. 29, 1984, 59-62041

Int. Cl.[4] F16F *3/00, 25/00;* **A47C** *3/00, 7/02*

U.S. Cl. 267—89 **6 Claims**



1. An adjustable cushion support comprising:

a cushion;

a frame member for supporting said cushion;

spring means mounted on said frame member for directly supporting said cushion;

holding means connecting said spring means to said frame member for flexibly holding said spring means; and

control means mounted on said frame member and connected to said spring means for adjusting the holding pressure applied to said spring means, said control means including:

enforcement means pivotally supported on said frame member for pushing said spring means upward, said enforcing means having a first arm portion connected to said spring means and a second arm portion;

biasing means connected to said second arm portion for maintaining the holding pressure applied by said enforcement means to said spring means; and

an operating lever mounted on said frame member and having a control arm connected to said biasing means and movably positioned along said frame member to control the inclination of said biasing means, thereby regulating the holding pressure applied to said spring means, said operating lever also having arresting means for affixing said operating lever to said frame member.

4. An adjustable cushion support comprising:

a cushion;

a frame member for supporting said cushion and having a front portion and a rear portion;

bar means extending between opposite sides of said frame member proximate said front portion;

support means mounted on said frame member between said front portion and said rear portion for flexibly supporting a load imposed thereon, said support means including:

spring means for directly supporting said cushion;

forward holding means connecting said spring means to said bar means for holding said spring means to support said cushion and for limiting movement between said support means and said frame member; and

rearward holding means connecting said spring means to said rear portion for holding said spring means to support said cushion and for limiting movement between said support means and said frame member;

control means mounted on said frame member and con-

nected to said support means for adjusting the holding pressure applied to said spring means, said control means including:

a rotatable operating lever;

plate means connected to said frame member and operatively connected to said operating lever for movement therewith;

biasing means extending between said plate means and said support means for maintaining the holding pressure applied to said spring means depending upon the inclination of said biasing means; and

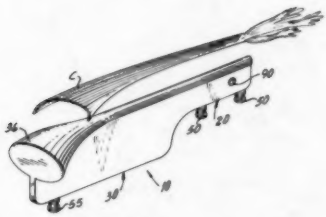
engagement means formed along said plate means for adjusting the inclination of said biasing means in response to said operating lever, thereby regulating the holding pressure applied to said spring means.

4,682,764

CELERY PEELING HOLDER

Juan E. Renaud, 9170 Fountainbleau Blvd., Apt. 103, Miami, Fla. 33172

Filed Mar. 27, 1986, Ser. No. 844,945
Int. Cl.[4] B25B *1/00*
U.S. Cl. 269—3 **3 Claims**



1. A holder for celery having a wide and a narrow end, comprising:

A. an elongated handle member that includes an underside and including first post means mounted to said underside and, further including first rubber band means including a hole substantially on each end and so arranged and constructed to be removably mounted to said first post means and placed around the narrow end of said celery; and

B. an elongated support member for said celery integrally built on one end of said handle member and having a convex headed termination on the end of said support member opposite to said handle member and said headed termination having a shape that substantially follows the concave contour of the inner walls of said celery on its wide end.

4,682,765

WELDING JIG APPARATUS

Jack Mainville, 25 Goffe St. North, Meriden, Conn. 06450

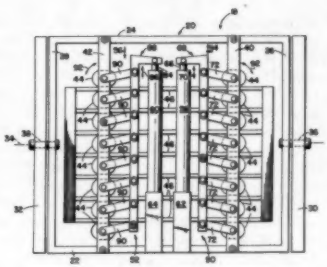
Filed Dec. 19, 1985, Ser. No. 811,106
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—41 **3 Claims**

1. Welding jig apparatus for holding a plurality of bar stock workpieces in an intersecting and aligned relationship to form a metal grating structure, each of the bar stock workpieces extending lengthwise for a substantially greater distance than its height and having a predetermined thickness and further having a first planar face at one side of the workpiece and defined by the length and height and a second planar face disposed opposite the first face at the other side of the bar, said apparatus comprising:

a base;

a work surface supported by said base and including two longitudinal side members and two end members, each of said end members being positioned transversely between said side members in a spaced relationship and connected togehter to define a rectangular shaped work surface, said work surface further being arranged for limited pivotal movement about an axis extending transversely between said end members and generally along a line midway between and parallel to said side members;

clamping means comprising a plurality of radial clamping cams, each of said cams being elongated along its length and extending generally perpendicularly from said work surface and in a common direction, each of said cams further having four cam surface along its length wherein first and second surfaces are arcuate shaped and oppositely disposed from one another and third and fourth cam surfaces are flat faced and oppositely disposed from one another and each cam having an axis of elongation, said cams further being located transversely between said two side members and forming two rows of cams, said rows being spaced apart and generally parallel to said end members and to each other and each cam in one row having a cam opposite itself in the other row with the axes of elongation of the oppositely disposed cams defining an associated common line and each of said axes of elongation being parallel to one another, each of said cams further being arranged for rotation about an axis extending lengthwise through the center of the cam;



linkage means comprising a driving bar and connecting bars, one end of said connecting bar being pivotally coupled to said driving bar and the other end of said connecting bar being fixedly connected to said cam, each of said connecting bars associated with a row of cams being substantially simultaneously with one another each of said cams in a said row between a nonclamping and a clamping position when said driving bar is operated between a first and second position, said cams being rotated to said nonclamping position for locating a workpiece between two adjacent cams in a row, said cam flat faces parallel to one another for accepting a workpiece placed between them, said cams being rotated to said clamping position for holding the workpieces in a spaced apart, parallel relationship with one another, said cam arcuate shaped surfaces of two adjacent cams engaging with the workpieces surface to clamp the workpiece in the desired position;

motor means coupled to the linkage means for operating said driving bar between said first and second positions, and

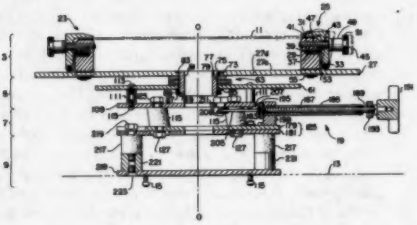
rotating means for tilting said work surface about the pivot axis to one of a number of intermediate work positions to facilitate the welding of intersecting pieces of bar stock into said grating structure.

4,682,766

X-Y-Z ROTATION POSITIONING SYSTEM USING FLEXIBLE MOUNTINGS

Vincent Barkley, Arlington, Va., assignor to Pace, Incorporated, Laurel, Md.

Filed Aug. 6, 1985, Ser. No. 762,843
Int. Cl.[4] B23Q *1/18*
U.S. Cl. 269—71 **34 Claims**



1. A workpiece positioning apparatus for adjusting the position of a workpiece relative to a tool, said workpiece positioning apparatus comprising:

workpiece holding means, having an axis of rotation, for releasably holding a workpiece, said workpiece holding means rotatable about said axis;

first support means for rotatably supporting said workpiece holding means for rotation about said axis, said first support means movable substantially transversely of said axis;

second support means for resiliently supporting said first support means for movement substantially transversely of said axis, said second support means yieldably resisting relative movement between said first support means and said second support means, said second support means movable substantially transversely of said axis;

third support means for resiliently supporting said second support means for movement substantially transversely of said axis, said third support means yieldably resisting relative movement between said second support means and said third support means, said third support means fixedly positionable relative to said tool;

rotation actuation means, operatively connected to said workpiece holding means and said first support means, for rotating said workpiece holding means about said axis of rotation relative to said first support means;

first translation means, operatively connected to said first support means and said second support means, for moving said first support means, relative to said second support means, in a first direction substantially transverse to said axis of rotation;

second translation means, operatively connected to said second support means and said third support means, for moving said second support means, relative to said third support means, in a second direction substantially transverse to said axis of rotation, said second direction substantially transverse to said first direction.

4,682,767

APPARATUS FOR FOLDING AND DELIVERING SHEET MATERIAL

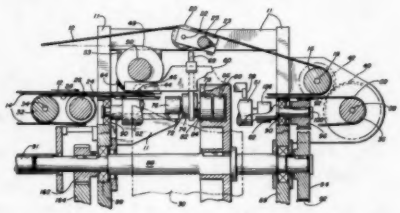
Francis J. Littleton, 182 McNair Rd., Buffalo, N.Y. 14221

Filed Aug. 23, 1985, Ser. No. 768,897
Int. Cl.[4] B41C *1/00*
U.S. Cl. 270—45 **5 Claims**

1. An apparatus for folding individual sheets in a stream of spaced incoming sheets traveling at an initial lineal speed, comprising a slow-down section for decelerating each sheet, a chopping section downstream of the slow-down section for receiving the decelerated sheets from the slow-down section, successively forming a fold in the sheets, and directing the folded sheets to a delivery section; and a delivery section downstream of the chopping section for receiving folded sheets from the chopping section and delivering the sheets to a desired station; wherein

a. the slow-down section comprises a first slow-speed conveyor means having a lineal speed substantially less than said initial lineal speed of the incoming sheets, a first snubber means spaced apart from the face of the first slow-speed conveyor means, the incoming sheets being received between the first snubber means and the face of the first slow-speed conveyor means, and means for driving the first snubber means in synchronism with the arrival of the sheets so as to press the tail of each incoming sheet into engagement with the first slow-speed conveyor means, which thereafter transports the sheets to the chopping section;

b. the chopping section comprises a support means for receiving and supporting a sheet arriving from the slow-speed section and including a slot oriented in a predetermined relation to the position of a sheet received and supported by the support means, a chopper plate, means for controllably reciprocating the chopper plate through



the slot between a first position above the support means and a second position below the support means, thereby engaging and initiating a fold in a sheet received and supported by the support means, and nip means positioned below the slot in the support means for receiving the leading edge of the folded sheet from the chopper plate, pressing the sheet to complete the fold in the sheet, and directing the folded sheet to the delivery section; and

c. the delivery section comprises a second slow-speed conveyor means having a lineal speed less than the lineal speed of the sheets supplied to the delivery section by the chopping section and a second snubber means spaced apart from a face of the second slow-speed conveyor means, the sheets from the chopping section being received between the second snubber means and the face of the second slow-speed conveyor means, and means for driving the second snubber means in phase with the arrival of the tail of the sheets so as to press the tail of each sheet onto the second slow-speed conveyor means to slow the sheet to the speed of the second slow-speed conveyor means.

4,682,768

BILL RECEIVING/DISPENSING APPARATUS

Koujirou Iida, Kagamigahara; Yasuo Yoshioka, Gifu; Hiroshi Ogawa, Inazawa; Kiyoshi Haruno, and Tsugio Ohigashi, both of Aichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

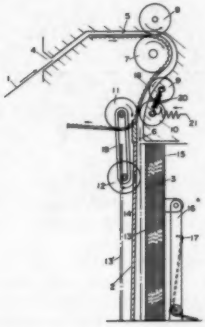
PCT No. PCT/JP84/00473, § 371 Date Jun. 5, 1985, § 102(e) Date Jun. 5, 1985, PCT Pub. No. WO85/01820, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 5, 1984, Ser. No. 744,488

Claims priority, application Japan, Oct. 11, 1983, 58-188522; Oct. 11, 1983, 58-188523

Int. Cl.[4] B65H *3/46*

U.S. Cl. 271—3.1 **6 Claims**



1. A bill receiving/dispensing apparatus comprising:

a passage with a conveying device for conveying a bill inserted through a slot;

a bill storing device communicating with said passage for storing bills conveyed in a first direction by said conveying device in a neatly arranged stack; said conveying device being configured to rotate forwardly to convey bills to said storing device and reversely to convey stored bills to said slot when bills are paid out from said bill storing device; and

a reversing roller for rotating reversely relative to a bill conveying direction of said conveying device, said reversing roller being provided in said passage and disposed at a position facing said conveying device in the vicinity of said bill storing device, said reversing roller causing only a single bill at a time to be completely extracted from said bill storing device and conveyed to said slot by said conveying device.

4,682,769

SHEET SUPPLYING APPARATUS

Reiji Murakami, Yokohama; Shinichi Hashimoto, Fujisawa; Mamoru Shimono, Yokohama, and Fumito Ide, Zama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1984, Ser. No. 643,275

Claims priority, application Japan, Aug. 26, 1983, 58-155753

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—10 **2 Claims**

1. A sheet supplying apparatus for supplying a sheet from a stored location, comprising:

sheet storing means for storing sheets;

pickup means for picking up sheets from said sheet storing means one by one, said pickup means including a substantially semi-cylindrical pickup roller which is rotatable about a fixed axis and which has a contact surface which contacts a sheet to be picked up and a flat noncontact surface as a part of a peripheral surface thereof, said flat surface being smaller in area than an area of a plane passing through the center of the pickup roller;

register means for aligning the sheet picked up by said pickup roller and for supplying the picked up sheet to the sheet feed location, said register means including a pair of rotatable register rollers which contact each other at a nip portion thereof;

guide means for guiding the picked up sheet along said flat surface of the pickup roller into said nip portion between the register rollers; and

driving means for: first, rotating only said pickup roller to pick up the sheet and to transport the sheet to a location where the leading edge of the picked up sheets abuts against the nip portion of said register rollers, next, stopping the rotation of the pickup roller while keeping the trailing edge of the sheet engaged with said pickup roller thereby ensuring that alignment of the sheet is maintained, and next rotating simultaneously the pickup roller and at least one of the register rollers to supply the aligned sheet to the sheet feed portion;

wherein said driving means includes:

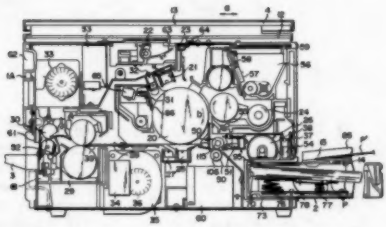
a first drive shaft on which said pickup member is mounted, said first drive shaft being arranged to rotatably support said pickup member;

a first drive gear mounted on said first drive shaft;

first clutch means, arranged between said first drive shaft and said first drive gear, for controlling transmission of a driving force from said first drive gear to said first drive shaft;

a second drive shaft on which one of said pair of register rollers is mounted, said second drive shaft being arranged to rotatably support said one of said pair of register rollers;

a second drive gear mounted on said second drive shaft;



second clutch means, arranged between said second drive shaft and said second drive gear, for controlling transmission of a driving force from said second drive gear to said second drive shaft;

connecting means for connecting said first drive gear and said second gear so as to transmit the driving force therebetween;

a drive source for driving at least one of said first drive gear and said second drive gear;

first controlling means for controlling a timing of transmission of the driving force by said first clutch means; and

second controlling means for controlling a timing of transmission of the driving force by said second clutch means; and

wherein said first clutch means includes:

an arbor fitted and fixed around said first drive shaft;

a spring wound around said arbor and having one end fixed on said arbor; and

a sleeve formed to surround said spring, said sleeve being fixed on said first drive gear, the other end of said spring being stopped by said sleeve wherein said sleeve has said first and second engaging projections which are spaced apart from each other at a predetermined angular interval along a circumferential direction thereof, and

said first clutch means does not transmit the driving force from said first drive gear to said first drive shaft when a first or second engaging projection is stopped, and said first clutch means transmits the driving force when said

first or second engaging projection is not stopped, and wherein said first controlling means includes:

a solenoid; and

a swingable stop lever, disposed in a vicinity of said solenoid, for engaging with said first engaging projection when said solenoid is energized to attract the stop lever and engaging with said second engaging projection when said solenoid is deenergized.

4,682,770

OUTPUT DEVICE IN A PRINTING MECHANISM FOR SINGLE DOCUMENTS SEPARATED FROM A PERFORATED CONTINUOUS-FORM PAPER WEB

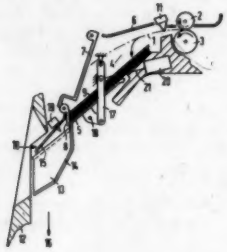
Josef Dempf, Klosterlechfeld, and Erich Moser, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 820,803

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502515

Int. Cl.[4] B65H *43/08*

U.S. Cl. 271—176 **7 Claims**



1. An output device in a printing mechanism for single documents separated from a perforated continuous-form paper web wherein the documents are transported into an output stacker after the printing and parting operation, the operation being enabled by user-associated authorization cards which are insertable into a badge reader, comprising: a collection stacker, which is not accessible from the exterior of said mechanism, for collecting all documents of a user preceding said output stacker, being situated above said output stacker, a retention mechanism provided at the output of said collecting stacker, a document supporting surface projecting into said output stacker and at least two braking elements resiliently supported on said supporting surface being provided in said collecting stacker, said retention mechanism being situated such at the output of said collecting stacker that said documents slide into said output stacker given an opened retention mechanism, said retention mechanism opening after the arrival of the last document with respect to the individual user and initiating further transport of all documents contained in said collecting stacker into said output stacker in common.

4,682,771

MASSAGE-FUNCTIONAL PEDAL STRUCTURE

San B. Jean, 81-1, Hsin Hsing Rd., Toucheng Jenn, I-LAN Shiann, Taiwan

Filed Sep. 18, 1985, Ser. No. 777,452

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—73 **12 Claims**

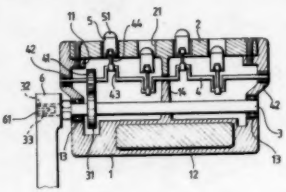
1. A pedal for a rotary crank exercise apparatus which has a massaging effect on a user's foot comprising:

a pedal body having an opening on one end thereof, said opening extending inwardly of said pedal body to define a hollow interior;

a rotating shaft rotatably mounted in said interior of said pedal body, said shaft having a gear connected thereto in said interior of said pedal body and means on an end of said rotating shaft for attachment to a crank arm of an exercising apparatus;

at least one crank shaft rotatably mounted in said pedal body, each said crank shaft having a pinion engaging said gear of said rotating shaft for imparting rotation to each said crank shaft when said rotating shaft is rotated, each said crank shaft having a plurality of offset portions within said interior of said pedal body;

a face board having a plurality of through-holes each of which corresponds to one of said offset portions, said face board mounted in said opening of said pedal body;



a plurality of elongated cylinders each of which is slidably disposed in a respective through-hole of said face board; and

a plurality of links each of which is pivotally connected at one end thereof to a respective elongated cylinder and at the other end thereof to a corresponding one of said offset portions, each of said links having a length which causes a corresponding elongated cylinder to reciprocate from positions above and below an outer surface of said face board when said rotating shaft is rotated to thereby produce a massaging effect on the sole of a user's foot.

4,682,772

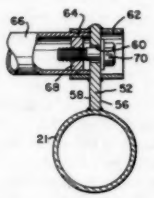
PLAYGROUND EQUIPMENT INCLUDING VANDAL RESISTANT MECHANICAL ASSEMBLY

Gerald P. Skalka, Washington, D.C., assignor to Victor Stanley, Inc., Dunkirk, Md.

Filed May 30, 1985, Ser. No. 740,053

Int. Cl.[4] A63B *9/00*

U.S. Cl. 272—113 **18 Claims**



1. A mechanical assembly providing a vandal resistant connection between first and second structural members comprising:

a front lower lug plate extending rearwardly from said first structural member and having first and second parallel surfaces between which a bolt receiving opening extends;

open-ended tubular sleeve means extending outwardly both from said first and second parallel surfaces in surrounding relation to said bolt receiving opening;

said second structural member comprising a front lower hollow tube having an outer diameter no greater than the inner diameter of said open-ended tubular sleeve members so as to matingly fit therein with one end facing one of said parallel surfaces and plug means positioned internally of said front lower hollow tube inwardly of said one end

thereof and including a threaded bore in alignment with said bolt receiving opening; and

bolt means extending through said bolt receiving opening and threadably received in said threaded bore and having a bolt head fully enclosed within said tubular sleeve means and engaged with the other of said parallel surfaces for providing a fixed connection between said first and second structural members.

4,682,773

BASEBALL TRAINING BAT

Gino Pomilia, 111 Palm Ave., Corte Madera, Calif. 94925

Continuation of Ser. No. 554,027, Jan. 23, 1984, abandoned, which is a continuation of Ser. No. 323,726, Nov. 23, 1981, abandoned, and Ser. No. 121,999, Feb. 19, 1980, abandoned. This application May 28, 1985, Ser. No. 737,907

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—26 B **31 Claims**

1. A bat comprising an elongated hollow tubular member having opposite ends said elongated hollow tubular member being between 32 and 36 inches in length and between 48 and 55 ounces in weight, and, said hollow tubular member having a central cavity and including a handle portion adapted to be gripped by a batter and a shaft portion extending from said handle portion and providing a striking surface for a thrown ball, means within said central cavity for reinforcing said hollow tubular member against bending, the handle portion having a generally uniform diameter along its length, said shaft portion having a diameter along the length thereof which is substantially equal to that of the diameter of said handle portion, the weight to length ratio of said bat being substantially constant along the length of said bat, and the diameter of said shaft portion being substantially uniform along the length thereof so that the striking surface for said bat is of uniform diameter from the handle portion through the end of said shaft portion remote from said handle portion and so that said striking surface is smaller in diameter than that of a conventional bat having a flared striking surface.

4,682,774

COLLAPSIBLE, RE-COMBINATIVE MARTIAL-ARTS WEAPON

Stephen M. Holy, Urbana, Ill., assignor to Joseph Arvidson; Sharon K. Wells and Thomas E. Skoza, all of Champaign, Ill.

Filed Oct. 31, 1985, Ser. No. 793,271

Int. Cl.[4] A63B *59/00*

U.S. Cl. 273—84 R **6 Claims**

1. A knockdown, re-combinative martial-arts weapon comprising in combination:

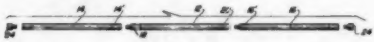
an elongated center component having a first end comprising a first coupling element thereof, and a second end comprising a second coupling element thereof, each said coupling element allowing attachment of the respective end of said center component to an end of another component having a mating coupling element thereof;

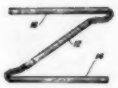
a first elongated end-piece component having a first end comprising a third coupling element thereof for mating engagement with another end of a different component, and a second end remote from said first end;

at least one flexible-link component having a first end comprising a fourth coupling element for attachment to an end of one of said first elongated end-piece component and said elongated center component, and a second end remote from said first end; said flexible-link component comprising a flexible, elongated member that is capable of winding around an object at which it was thrown, said flexible, elongated member comprising one end secured to said fourth coupling element, and another end remote from said one end;

whereby said components may be interchangeably arranged to form different martial-arts weapons;

said flexible-link component comprising a fifth coupling element, said another end of said flexible, elongated member being secured to said fifth coupling element, such that said flexible-link component is capable of being connected between one end of said center component and one end of said end-piece component, so that said end-piece component and said center component may be moved relative to each other about said flexible, elongated member of said flexible-link member;





said fourth coupling element of said flexible-link component comprising at least a partially-hollow interior on the face thereof facing said fifth coupling element when said flexible-link component is extended linearly along a line, said one end of said flexible elongated member being attached within said hollow interior; said fourth coupling element having an opening at the end thereof; and said fifth coupling element comprising a projecting portion for mating engagement in said opening of said fourth coupling element, so that said flexible member may be hidden and stored in said hollow interior of said fourth coupling element when said projecting portion is inserted into said opening, and may be alternatively exposed and extended for use by which said end-piece component and said center component may be given relative movement therebetween via the adjacent ends connected to the ends of said flexible-link component.

4,682,775

GOLF SWING TRAINING DEVICE

John M. Wood, 4849 35th St., San Diego, Calif. 92116

Filed Feb. 24, 1986, Ser. No. 832,065

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—186 A **5 Claims**

1. A golf swing training device comprising:

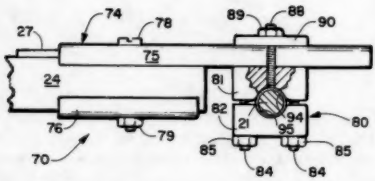
a primary clamp assembly for attaching the training device

to the shaft of a golf club such as an iron or a wood, said primary clamp assembly having a front end, a rear end, a top surface and a bottom surface, said primary clamp assembly having a top block member and a bottom block member, the bottom surface of said top block member and the top surface of said bottom block member having mating semi-cylindrical channels in them for receiving the shaft of a golf club;

an elongated training arm having a predetermined length at least 16 inches long, said training arm being formed of a rigid material;

a secondary clamp assembly having a channel shaped top bracket and channel shaped bottom bracket and one end of said training arm being clamped between them; and

an elongated connecting plate having its rear end rigidly



attached to the top surface of said channel shaped top bracket and its front end pivotally mounted to the top surface of said primary clamp assembly, means for locking said front end of said elongated connecting plate at predetermined angles so that the free end of said elongated training arm would be in close proximity to an area slightly below the right knee of a right handed golfer as he addresses the golf ball with his club face square to the proposed direction of flight of the ball, the free end of said elongated training arm being free to travel past the golfer's right knee so long as the face of his club head is square or closed, but will cause the free end of said elongated training arm to strike his leg below his knee if the club head reaches the ball with its face oriented in an open position which would cause the ball to travel in a trajectory known as a slice.

4,682,776

USER WORN ARM BEND CONTROL DEVICE

William Mitchell, 618 S. Seventh St., Delavan, Wis. 53115, and Herbert Langston, 501 E. 32nd, Apt. 1211, Chicago, Ill. 60616

Filed Nov. 6, 1985, Ser. No. 795,327

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—189 A **14 Claims**

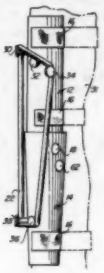
1. An arm-straightening and locking device with automatic releasing means for bowlers and golfers, comprising:

a first, upper shell-portion for placement about the upper, rear portion of an arm;

a second, lower shell-portion for placement about the lower, rear portion of an arm of a bowler or golfer;

means for pivotally connecting the lower end of said first shell-portion to the upper end of said second shell-portion to allow relative rotation therebetween, such that said shells may be in rectilinear alignment in a first relative orientation, and may be positioned at an angle relative to each other in a second relative orientation;

biassing means operatively connected with e.. h of said first and second shell-portions for urging in a first .. thereof said first and second shell-portions into said fir.. relative orientation where they are in a substantial rectilinear



alignment, and for urging in a second state thereof said first and second shell-portions away from said first relative rectilinear orientation toward said second relative orientation where said shell-portions are positioned at an angle with respect to each other, such that at the point of follow-through said shell-portions are allowed to have relative rotational movement upon the application of sufficient force to cause said biassing means to take said second state thereof; and

means for mounting said biassing means in said first state and said second state, and for allowing movement of said biassing means between said first and second states.

4,682,777

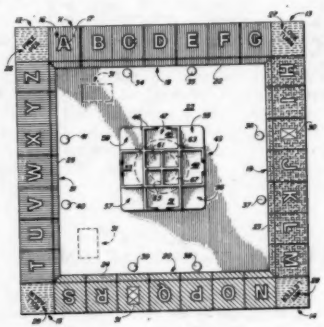
BOARD GAME

Thomas J. Wood, 2249 W. Villa Maria, Phoenix, Ariz. 85023

Filed Jul. 10, 1986, Ser. No. 883,925

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—243 **20 Claims**



15. A word/definition/spelling board game apparatus comprising:

a generally rectangular game board having four corner spaces and four sets of seven playing spaces each disposed

sequentially between opposite corner spaces, each of said four sets of player spaces having a different and distinct characteristic color and each of said player spaces bearing indicia means, wherein 26 of said player spaces bear a different and distinct alphabetical letter of one of the 26 letters of the alphabet and the remaining two of said player spaces bearing a first and second special symbol means respectively;

four player pieces each having a different and distinct characteristic color corresponding to the different and distinct characteristic colors of the four sets of the player spaces, respectively;

four sets of marker means, each set of marker means including a different and distinct characteristic color corresponding to the colors of said player pieces;

four sets of cover tiles, each of said sets of cover tiles having a different and distinct characteristic color corresponding to the colors of said player pieces; and

a deck of playing cards including four sub-decks each having a different and distinct characteristic color corresponding to the colors of said four player pieces, each of the cards within a given colored set including a plurality of definitions on one side thereof and the plurality of properly spelled words corresponding to said definitions on the other side of said card, the predetermined number of definitions and words on each card being dependent upon the particular number of letters of the alphabet on a particular side of the board corresponding to said different and distinct characteristic color; and

chance means for determining the number of spaces a player piece moves on a given turn, the player space on which the player piece lands on a given turn having its different and distinct characteristic color of that given set of player spaces used to decide the color of card selected for that player, and the definition selected depending upon the first letter of the word to be defined on said card corresponding to the particular letter indicated on the player space on which the player piece is located on that turn.

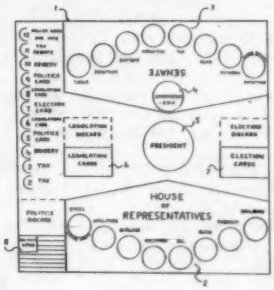
4,682,778

POLITICAL GAME UTILIZING DIE WITH INTERCHANGEABLE FACES

Wayne H. Willis, 2420 Albany Ave., Loveland, Colo. 80537, and Keith M. Willis, 8 W. Olive St., Marshalltown, Iowa 50158

Filed Mar. 13, 1986, Ser. No. 839,262
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—257 **3 Claims**

1. A board game for a plurality of players comprising: a game board, a plurality of cards and at least two dice; said game board having indicia located thereon representing a Senate voting area and a House of Representatives voting area, each voting area having associated therewith a plurality of representations of different industries, each of said industries being represented by a different first indicia, said game board further including a plurality of second indicia, each of said second indica having associated therewith instructions for the players during play of the game; said plurality of cards having indicia thereon representing various opportunities for election and various advantageous or detrimental instructions to the players during play of the game; said at least two dice comprising a first die and a second die, said first die having a plurality of faces, each of said faces having indicia thereon corresponding to said first indicia on said board, said first indicia on said faces of said first die being removably attachable such that said first die can display various combinations of said first indicia dependent upon the number of players playing the game, said second die having a plurality of faces with each face having indicia thereon corresponding to said second indicia on said board so that upon manipulation of said second die, the players



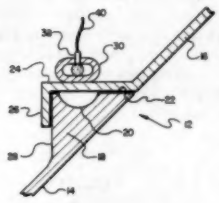
will be directed to one of the instructions on the board associated with one of the second indicia.

4,682,779

EXPLOSIVELY DRIVEN LATCH/SEAL DEVICE

Robert A. Feight, 22331 Covello St.; Vance W. Jaqua, 6916 Shoup Ave., both of Canoga Park, Calif. 91303, and Joseph Trom, Jr., 63 N. Locust Ave., Agoura, Calif. 91301

Filed Aug. 10, 1984, Ser. No. 639,556
Int. Cl.[4] B23K *31/02;* **F16J** *15/46;* **F16L** *39/00*
U.S. Cl. 277—34.3 **16 Claims**



1. Means for latching and sealing the forward end of an extendible, mating, section and the rear end of an associated, fixed, mating section after full extension of the extendible section comprising:

an axially extending flange affixed to the front end of the extendible section and having an inner surface;

a radially extending projection affixed to the rear end of the fixed section and having an outer surface adjacent to the inner surface of the extendible section, said projection being formed with a recess therein opening inward from said outer surface;

a deformable member in close proximity to the recess, said member defining a container;

explosive means contained within said deformable member; and

means for detonating said explosive means to expand the deformable member, the expansion causing a seal to occur

between the flange and the projection whereby the two are locked together and sealed in the recess area.

4,682,780

ROD CHUCKING DEVICE FOR A PERFORATOR FOR PERFORATING A PIG IRON DISCHARGE OPENING IN A BLAST FURNACE

Kenichiro Kurama, Hiroshima, and Michiyasu Shibata, Yokohama, both of Japan, assignors to Mazda Motor Corporation, Hiroshima and Nippon Kokan Kabushiki Kaisha, Tokyo, both of, Japan

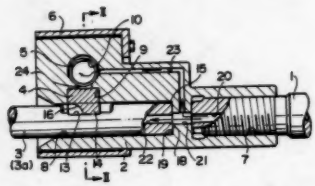
PCT No. PCT/JP85/00205, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO85/04904, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 16, 1985, Ser. No. 824,706

Claims priority, application Japan, Apr. 16, 1984, 59-56327

Int. Cl.[4] B23B *31/06*; C21C *3/48*

U.S. Cl. 279—79 **7 Claims**



1. A rod chucking device for a perforator for perforating a pig iron discharge in a blast furnace, said rod chucking device comprising

a rod insert hole formed in a front portion of said socket for mounting a perforating rod, said perforating rod being inserted into said rod insert hole,

a cotter for securing said perforating rod, said cotter being slidably mounted in a cotter hole formed in said socket perpendicularly to said rod insert hole so that said perforating rod is adapted to be locked in said socket, said cotter being disposed movably between an engage position and a disengage position,

a spring for urging said cotter towards said engage position,

a rod connecting hole for connecting said impact rod with said socket, said rod connecting hole being in communication with a spring mount hole through an air passage so that air supplied from said impact rod is injected into said spring mount hole through said air passage to chill said spring.

4,682,781

SLED SKIS

James Dickens, 28 Westland St., Hartford, Conn. 06120

Filed Feb. 20, 1986, Ser. No. 831,933

Int. Cl.[4] B62B *13/04*

U.S. Cl. 280—22 **3 Claims**

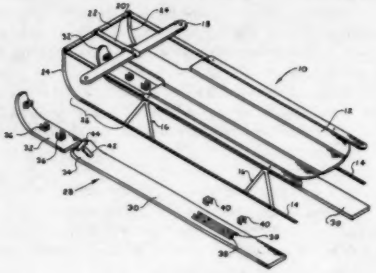
1. In a snow sled comprising a platform supported by two essentially parallel sled rails, a portion of each sled rail being actuated by a steering means and defining a bendable steering portion and a non-steering portion, the steering portion of each sled rail being upwardly curved at a forward end thereof, the improvement comprising:

a pair of sled skis adapted for attachment to the sled rails, said sled skis being wider than the sled rails;

wherein each of said sled skis includes two separate and unattachable pieces, a first piece having a curve corresponding to the bendable steering portion of each sled rail and being attachable to said sled rail steering portion, and a second piece corresponding to and being attachable to the non-steering portion of each sled rail;

wherein said second piece of said sled ski has an upwardly curved portion at a forward end thereof; and including

a recessed slot extending longitudinally through the central



portion of said upwardly curved portion of said second piece said recessed slot adapted to receive said sled rail therein and means for releasably retaining said sled rail within said recessed slot.

4,682,782

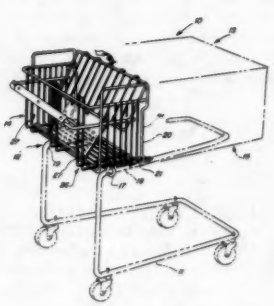
SHOPPING CART WITH IMPROVED BABY SEAT

Frank Mills, Rockford, Ill., assignor to Tote-Cart Company, Rockford, Ill.

Continuation of Ser. No. 754,705, Jul. 15, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,716

Int. Cl.[4] B62B *3/00*

U.S. Cl. 280—33.99 B **20 Claims**



1. In a shopping cart having a wheeled frame and a basket carried on the frame and defining a horizontal rear seat portion and an upright rear wall having leg holes for passing rearwardly therethrough the legs of a baby sitting on said rear seat portion in a baby seat at the rear of the basket, the improvement comprising:

wall means;

mounting means swingably mounting said wall means to said basket for disposing the wall means to selectively define

(a) a seat back upstanding from said rear seat portion for supporting the back of a baby sitting in said baby seat space with the legs of the baby extending rearwardly through said leg holes, and

(b) a downwardly hanging leg hole closure for closing said leg holes with said baby seat space opening forwardly in said basket whereby the entire basket may be used to receive objects and passage of such objects rearwardly through said leg holes from the gasket is effectively prevented, said mounting means comprising a first panel pivotally connected to said basket forwardly closely spaced from said rear wall, and said wall

means comprising a second panel pivotally connected to said first panel to lie against said rear wall when disposed to close said leg holes, said first panel being inclined rearwardly upwardly from the said rear seat portion and said second panel hanging downwardly from said upwardly inclined first panel between said first panel and said rear wall of the basket when said wall means and mounting means are in the leg hole closing disposition.

4,682,783

WHEEL CHAIR

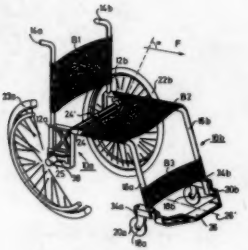
Rainer Küschall, Basel, Switzerland, assignor to Paratec AG, Basel, Switzerland

Filed Oct. 17, 1983, Ser. No. 542,655

Claims priority, application Switzerland, Oct. 20, 1982, 6097/82

Int. Cl.[4] A47C 4/28; A61G 5/02; B62M 1/14

U.S. Cl. 280—242 WC 25 Claims



1. A foldable wheelchair movable along a predetermined direction of movement,

comprising in combination

first and second side frames,

drive wheels and travelling wheels rotatably supported on said side frames, and

folding means extending between said side frames, movable between a folded position and an unfolded position, and including

first and second pivoting means, said first and second pivoting means each including two rods, said rods of said first pivoting means being substantially U-shaped, said rods of said first and second pivoting means being pivotable towards one another in a scissor-like manner about a respective center axis extending approximately along said direction of movement, each pivoting means having ends facing away from its respective center axis, and

at least one stop means operative in the unfolded position of said folding means, said stop means being encountered by at least one of said rods, said stop means including at least one crossbar secured to both sides of one rod at an end thereof remote from said respective center axis so as to abut in the unfolded position of said folding means onto the other of said rods,

each side frame defining first and second pivot axes, extending substantially parallel to said center axes,

the ends of said first pivoting means being pivotable about corresponding of said first pivot axes, and the ends of said second pivoting means being pivotable about corresponding of said second pivot axes,

said center axis of said first pivoting means and said first pivot axes being substantially aligned in a first plane, said center axis of said second pivoting means and said second pivot axes being substantially aligned in a second plane when said folding means is in said unfolded position,

said pivoting means being arrestable in said unfolded position, thereby rigidly connecting said side frames to one another.

4,682,784

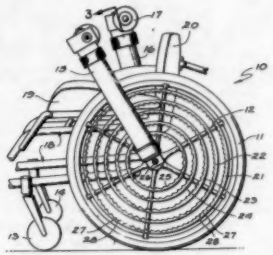
WHEELCHAIR WITH VARIABLE RATIO PROPULSION

Jack E. Anderson, 17787 Owen St., Fontana, Calif. 92335

Filed May 19, 1986, Ser. No. 864,472

Int. Cl.[4] B62M 1/14

U.S. Cl. 280—242 WC 20 Claims



1. A user propelled wheelchair or the like having a pair of relatively large driven wheels each mounted on and independently rotatable about an axle supported by the frame of said wheelchair, comprising:

first means including a plurality of concentric ratchet rings rigidly mounted in radially spaced relationship on said wheels;

second means including a pair of levers pivoted about said axles, one of said levers being installed or each side of said wheelchair for propelling said wheelchair by backward and forward pumping action of said levers;

third means including a plurality of pawls associated with each of said levers, said pawls being arranged such that only one pawl is operatively associated with a corresponding one of said ratchet rings at any one time, said ratchet rings having a sawtooth surface pattern such that said operative pawl slides over said ratchet ring during one directional sense of said lever pumping action and engages said sawtooth surface to impart a torque thereto during the other sense of said long pumping action; and

user controlled means for selecting the one of said pawls in operative relationship with a corresponding ratchet ring for effecting change of the torgue ratio between said levers and said driven wheels.

4,682,785

CROSS-COUNTRY SKI BINDING

Roland Jungkind, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG, Herzogenaurach, Fed. Rep. of Germany

PCT No. PCT/DE85/00052, § 371 Date Oct. 22, 1985, § 102(e) Date Oct. 22, 1985, PCT Pub. No. WO85/03643, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 22, 1985, Ser. No. 796,018

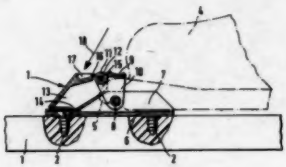
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406439; Jul. 20, 1984, 3426856

Int. Cl.[4] A63C 9/00

U.S. Cl. 280—615 10 Claims

1. A cross country ski binding for cross-country ski boots having a forwardly extended front sole end portion, which is formed as a downwardly directed hook means, comprising a base plate mountable on a ski, a pair of side jaws extending upwardly from said base plate on opposite sides thereof for holding said front sole end portion therebetween, engagement means for cooperation with said hook means, a transverse member mounted in said side jaws and transversely extending therebetween, a U-shaped stirrup member having a web portion extending parallel with respect to said transverse member and having a pair of limb portions each projecting from a respective end of said web portion and having a free end by means of which said stirrup member is pivotably mounted on

said transverse member, spring means for urging said stirrup member into a position wherein said front sole end portion, when engaged with said engagement means, is clamped between said web portion and said base plate, and a thrust member pivotably connected to said stirrup member at one end and



bearing on a portion of said base plate at the other end to be pivotable about an axis extending parallel to said web portion with said thrust member moving in the longitudinal direction of said ski and pivoting about said axis when said stirrup member is pivoted about said transverse member.

4,682,786

SAFETY SKI BINDING

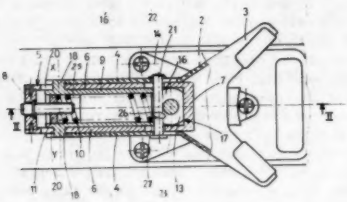
Henri Peyre, Nevers, France, assignor to Ste Look, French Societe Anonyme, Nevers, France

Filed Sep. 20, 1985, Ser. No. 778,244

Claims priority, application France, Oct. 4, 1984, 84 15229; Jul. 24, 1985, 85 11302

Int. Cl.[4] A63C *9/00*

U.S. Cl. 280—628 **7 Claims**



1. A safety ski binding comprising a boot-retaining jaw unit for securing either the toe end or the heel end of a ski boot, said boot-retaining jaw unit being mounted on a rotary body for upward pivotal displacement relative to said rotary body, said rotary body being in turn rotatably mounted on a pivot which is perpendicular to the ski and being maintained in a normal position thereof by a resilient mechanism comprising two flat faces which are formed on said pivot in opposite directions and against which a bearing surface formed on said rotary body and a piston housed within said rotary body are applied respectively by a single spring, said boot-retaining jaw unit being maintained in a normal position thereof by a cross-pin whose ends are in contact with guide ramps carried by said boot-retaining jaw unit, wherein:

(a) the first face against which said rotary body is applied is smaller in width than the flat face against which said piston is applied;

(b) said flat face against which said rotary body is applied is oriented in the direction opposite to the ski-boot location;

(c) the pivotal axis of said boot-retaining jaw unit is carried by said piston;

(d) said cross-pin is interposed between said piston and said pivot; and

(e) said guide ramps being sized, shaped, and positioned to produce a forward movement of said boot-retaining jaw unit upon upward pivotal displacement of said boot-retaining jaw unit by virtue of the fact that said cross-pin bears on said guide ramps.

4,682,787

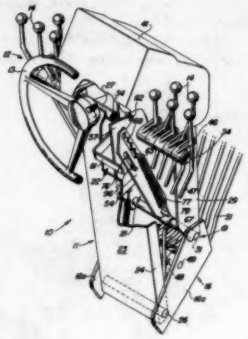
STEERING UNIT AND CONTROL LEVER CONSOLE FOR A VEHICLE

Martin L. Ruhter, and Allan F. Loney, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 21, 1986, Ser. No. 821,387

Int. Cl.[4] B62D *1/18*

U.S. Cl. 280—775 **11 Claims**



1. A steering unit and control lever console for a vehicle comprising:

pedestal means for supporting the vehicle steering unit and at least one vehicle control lever;

platform means pivotally mounting said pedestal means in an upward position on the vehicle for movement about a transverse axis to adjust the position of said pedestal means;

locking means pivotally mounted on said platform means for locking said pedestal means against pivotal movement upon movement of said pedestal means to an adjusted position; and

release means for disengaging said locking means whereby said pedestal means is pivotally movable to an adjustable position,

handle means pivotally secured to said pedestal means and protruding forwardly therefrom and disposed below the steering unit.

4,682,788

STEERING COLUMN SUPPORT STRUCTURE FOR A VEHICLE STEERING MECHANISM

Toshiteru Yoshimura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 17, 1985, Ser. No. 809,753

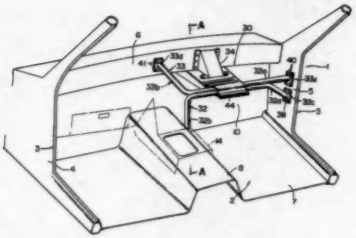
Claims priority, application Japan, Dec. 21, 1984, 59-270471

Int. Cl.[4] B62D *1/16*

U.S. Cl. 280—779 **9 Claims**

1. A vehicle steering column support structure including cowl side panels extending at the opposite sides of a vehicle body forwardly from door hinge pillars, a cowl inner panel extending transversely of the vehicle body and having opposite ends secured to the cowl side panels, respectively, a first support member in the form of a hollow rod, said first support member having a first portion connected at one end with one of the cowl side panels and extending along said cowl inner panel substantially to a transverse center portion of the vehicle body, said first support member having a second portion integrally formed with said first portion to extend downward from the other end of the first portion and having a lower end se-

cured to a floor panel of the vehicle body, a second support member in the form of a hollow rod, said second support member having a first portion secured at one end to said one cowl side panel and extending along said cowl inner panel substantially to a transverse center portion of the vehicle body, said second support member having a second portion integrally formed with said first portion to extend forward from the other end of the first portion of the second support member and having a forward end secured to the cowl inner panel, the first portions of the first and second support members being



arranged in substantially parallel relationship with each other, bracket means connecting said first portion of the first support member and said first portion of the second support member with a steering column assembly to support the steering column assembly by said first portions of the first and second support members, said bracket means including a first bracket member connecting together said first portion of the first support member and said first portion of the second support member, and a second bracket member connecting the steering column with said first bracket member.

4,682,789

SEAT BELT FORWARDING DEVICE

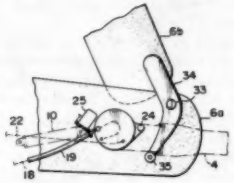
Kazuo Higuchi; Takayuki Sugama; Hisakazu Okuhara, all of Utsunomiya, and Kiichi Sasaki, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1985, Ser. No. 794,634

Claims priority, application Japan, Nov. 2, 1984, 59-231765

Int. Cl.[4] B60R *22/02*

U.S. Cl. 280—801 **1 Claim**



1. A seat belt forwarding device for facilitating the fastening of a seat belt by rotating a rotary arm carrying an end of the seat belt in a forward direction, in conjunction with a walk-in type seat, comprising:

a rotary unit for forwardly rotating the rotary arm in response to a closing action of a door and backwardly rotating the rotary arm in response to an opening action of the door; and

said rotary unit controlling the backwardly inclined position of the rotary arm in such a manner that the rotary arm may be positioned along a seat back when the seat back is in its upright positin and substantially along a floor behind the seat when the seat back is in its forwardly inclined position, wherein said rotary unit comprises a cam means provided in a lower portion of the seat back for cooperation wit a base end of the rotary arm, wherein said cam members comprises a roller supported by a lower end of a reclining plate serving as a hinge member between a main body of the seat and the seat back.

4,682,790

WEBBING RETAINING STRUCTURE

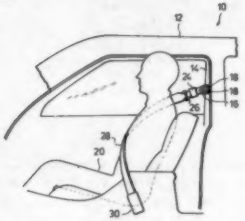
Mitsuaki Katsuno; Toshio Gyoda; Hideki Tanaka; Kunihiro Hurumoto; Noritada Yoshitsugu, and Kenji Matsui, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 27, 1986, Ser. No. 844,585

Claims priority, application Japan, Mar. 29, 1985, 60-46252; Mar. 12, 1986, 61-35733

Int. Cl.[4] B60R *21/00*

U.S. Cl. 280—801 **23 Claims**



1. A webbing retaining structure for use in an automatic seatbelt system for a vehicle so designed that one end portion of an occupant restraining webbing which is closer to the outside of the vehicle is moved in the longitudinal direction of the vehicle when an occupant enters or leaves the vehicle, thereby automatically fastening said webbing to the occupant's body, said structure being adapted for supporting said end portion of said webbing on the body of the vehicle, and comprising:

(a) a first support member for retaining said end portion of said webbing;

(b) a second support member secured to the vehicle body and pivotally supporting said first support member; and

(c) retaining means including a projection provided on either one of said first and second support members and a plurality of recesses provided in the other of the two so as to be spaced around the axis of rotation of the support member such that said projection selectively enters said recesses solely by the application of torque to said first support member, said projection and said recesses facing each other in a direction parallel to the axis for rotation of the first support member, whereby the angle at which said webbing is supported by the vehicle body can be discretely adjusted by changing the positional relationship between said projection and said recesses.

4,682,791

DEFLECTION DEVICE FOR A SAFETY BELT ARRANGEMENT HAVING PROGRESSIVE BELT CLAMPING

Hans-H. Ernst, Sülfeld, Fed. Rep. of Germany, assignor to Britax-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany

PCT No. PCT/EP85/00050, § 371 Date Oct. 24, 1985, § 102(e) Date Oct. 24, 1985, PCT Pub. No. WO85/03676, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 14, 1985, Ser. No. 793,698

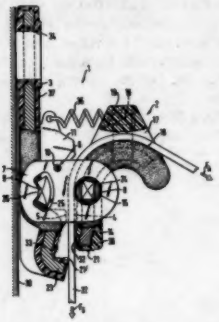
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406946; Apr. 3, 1984, 3412383

Int. Cl.[4] B60R *22/36*

U.S. Cl. 280—806 **24 Claims**

1. Deflection device for a safety belt preferably for mounting on the B and C columns of vehicles having means for direct

locking of the belt by clamping and for receiving the loading in the case of an accident, characterised in that a two-stage arresting device is provided in such manner that on the occurrence of the usual locking not caused by an accident after exceeding of a predetermined deceleration a first arresting action in the form of a clamping not damaging to the belt takes place by



tilting movement of a resiliently biased deflection element to bring two preclamping surfaces at least one of which is of a deformable material into mutual engagement with the belt, which in the case of an accident causing a higher deceleration transfers into a second arresting action having a more fully effective belt clamping for secure and substantially slip-free load absorption.

4,682,792

BINDER FOR ARTICLES SUCH AS BOOKS AND CASSETTES

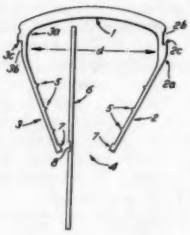
Graham Simmons, 13, Oriole Way, Larkfield, Maidstone, Kent ME20 6LN, England

Filed Apr. 10, 1986, Ser. No. 849,987

Claims priority, application United Kingdom, Apr. 11, 1985, 8509281

Int. Cl.[4] **B42D** *17/00, 3/12, 5/00;* **B42F** *7/00*

U.S. Cl. 281—45 **7 Claims**



1. A binder, to embrace and grip an article such as a book or cassette, comprising a resiliently-bendable generally planar front wall of width greater than that of the article to be embraced, two integral resiliently-bendable side walls extending rearwardly each from a respective lateral extremity of the front wall, said side walls being when unconstrained convergent towards their free edges, one said side walls having formed within the thickness thereof an external recess bounded by a plane inward-facing shoulder facing in the direcition of the free ends of said side walls, the other said side wall having formed within the thickness thereof an external recess bounded by a plane outward-facing shoulder facing in the direction of said front wall, said shoulders generally and substantially coplanar with said front wall and at the same spacing from a line of join of the respective side wall and the front wall, whereby a first such binder may be moved relative to a second such binder in a direction perpindicular to the plane of the front wall so as to cause the inward facing shoulder of the first such binder to abut the outward facing shoulder of the second such binder and locate the binders in alignment in a linear row.

4,682,793

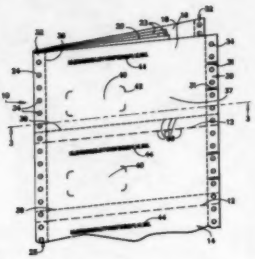
MULTI-PART MAILER FORM ASSEMBLY

Gerard F. Walz, 928 Quail Hill Rd., Fallbrook, Calif. 92028

Filed Mar. 5, 1986, Ser. No. 836,249

Int. Cl.[4] **B41L** *1/20;* **B65D** *27/00, 27/10*

U.S. Cl. 282—11.5 A **19 Claims**



1. A multi-part mailer assembly, comprising:

a series of superimposed continuous sheets having at least one aligned marginal side edge along which the sheets are adhesively secured together and copy producing means interposed between the sheets for reproducing information applied to the front sheet on all the underlying sheets, the outer front sheet of the assembly being of paper and the rear sheet being of card material;

the sheets having corresponding spaced transverse tear lines in registry with one another for separating the sheets into individual multi-part forms;

the assembly having lines of pin feed perforations extending along its opposite outer marginal side edges through all the sheets at those side edges for feeding the assembly through a printing machine;

the assembly having an outer longitudinal tear line extending adjacent the secured marginal side edge for separating the sheets from each other and from the line of pin feed perforations at that edge;

each multi-part form of the assembly having at least three seperable superimposed parts preprinted with predetermined indicia, the three parts including form lengths of a front sheet comprising an address sheet for insertion in a window envelope, a rear sheet comprising a return postcard for separation from the other sheets and for securing to the exterior of an item to be mailed for completion and return by the recipient of the mailed item, and an intermediate sheet comprising a sender's receipt for retention by the sender of a mailed item, the front sheet of each said form having a designated address area on its outer front face and the intermediate and rear sheets having front faces facing the rear of said front sheet which are marked with a corresponding address area in registry with the address area on the front sheet;

the rear and intermediate sheets of the assembly having additional tear lines for separating a predetermined detachable area of the rear and intermediate part of each form from the remainder of that part, the predetermined area of the intermediate and rear parts carrying the designated address area on their front faces and the rear part having an outer, rear face facing away from the remainder of the form carrying a designated return address area on its detachable area; and

the rear sheet having longitudinal strips of adhesive applied

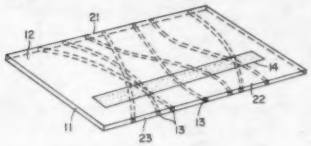
along the rear, outer face outside said predetermined area for detachably securing the predetermined area of the rear part of each form to an outer face of an item to be mailed, the outer face of the rear sheet further having peeloff longitudinal cover strips removably covering the adhesive strips.

4,682,794

SECURE IDENTIFICATION CARD AND SYSTEM

George D. Margolin, Newport Beach, Calif., assignor to Photon Devices, Ltd., Sherman Oaks, Calif.

Filed Jul. 22, 1985, Ser. No. 757,385
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—82 **3 Claims**



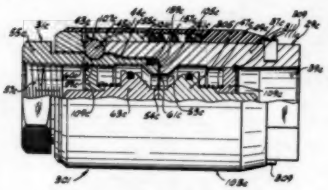
1. An identification card comprising an essentially planar member having first and second edges, said member including a plurality of optical fibers at least some of which have first and second ends which intersect said first and second edges respectively at random.

4,682,795

TENSION ACTUATED UNCOUPLER

Charles Rabushka, 1359 Whispering Pines, St. Louis, Mo. 63141, and Layton J. Reprogle, Berkeley, Mo., assignors to Charles Rabushka, St. Louis, Mo.

Continuation-in-part of Ser. No. 761,865, Aug. 2, 1985, which is a continuation-in-part of Ser. No. 619,120, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,242, Feb. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 401,083, Jul. 23, 1982, abandoned. This application Jan. 23, 1986, Ser. No. 821,808
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—1 **2 Claims**



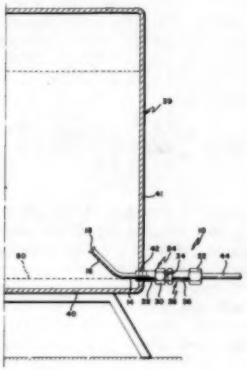
1. A tension actuated uncoupler installable in a line for permitting the flow of a fluid therethrough when coupled and for uncoupling at least a portion of said line from another portion thereof in the event a tension load above a predetermined limit being applied to said line, said uncoupler comprising a female quick disconnect fitting secured to one of said line portions and a male quick disconnect fitting secured to the other portion of said line with the male fitting being sealably secured within said female fitting when said male and female fittings are coupled together thereby to permit the flow of fluid through said line, a plurality of apertures in said female fitting, a plurality of securing balls carried by said female fitting, one said ball in a respective aperture, said balls being engagable with said male fitting for positively holding the fittings together in coupled relation, said balls being movable radially inwardly and outwardly between a retaining position in which said balls hold the fittings together in coupled relation and a clear position for permitting uncoupling of the fitting, cam means on said male fitting cammingly engagable with said balls for effecting radial movement of said balls toward their said clear position upon application of a tension load said fittings, a retainer movable axially relative to said female fitting from a retaining position in which said balls are engagable with said male fitting for holding said fittings in coupled relation and a retracted position permitting said balls to move radially thereby to permit uncoupling of said fittings, said retainer having a retainer cam surface for being cammingly engaged by said balls for axial movement of said retainer relative to said female fitting toward its retracted position upon a tension load being applied to said fittings, spring means resiliently biasing said retainer in axial direction toward its retaining position, seal means carried by one of said fittings sealingly engageable with the other fitting, a cover carried by said female fitting surrounding said spring and said retainer, said cover having an inner shoulder thereon with said spring being interposed between said shoulder and said retainer, said cover being axially movable on said female member between an operative position in which said spring exerts an operative biasing force on said retainer such that said tension load above said predetermined limit is required to effect uncoupling of said fittings and a released position in which said spring is at least partially relaxed so as to facilitate coupling of said fittings, at least one protrusion constituting cover holding means extending out from said female fitting and engaging said cover to prevent axial movement of said cover relative to said female fitting by said spring when said spring exerts its operative biasing force on said retainer, and said cover having a slot therein for accommodating said protrusion such that when said slot is in register with said protrusion, said cover is free to move axially relative to said female fitting from its operative to its released position.

4,682,796

FUEL LINE ADAPTOR

R. Alan Parrow, 53 Montana Dr., Holden, Mass. 01520, and Francis W. DiAntonio, 26 Fairview Dr., Leicester, Mass. 01524

Filed Apr. 29, 1986, Ser. No. 857,044
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—39 **7 Claims**



1. Fuel line adaptor for a fuel line having a standard pipe fixture and a fuel tank having a bottom wall, a front wall and an outlet opening in the front wall adjacent the bottom wall, said adaptor comprising:

(a) a first coupling element which is adapted to be sealingly connected with said outlet opening and having a bore

which extends horizontally when said first coupling element is connected with said outlet opening,

(b) a second coupling element which is adapted to be connected with said first coupling element and adapted to be connected to the pipe fixture of said fuel line, said second coupling element having a bore which extends horizontally when said second coupling element is connected with said first coupling element,

(c) a feed tube which has an outer end, an outlet opening at said outer end, an inner end portion one end of which is connected to the end opposite said outlet opening and an inlet opening at said inner end, said inner end, said outer end being adapted to extend horiziontally through the bores of said first and second coupling elements and through the outlet opening of the tank, said outer end having a central axis and being rotatable about said axis relative to said first and second coupling elements prior to complete coupling of said first and second coupling elements and said outer end being prevented from rotating about said axis when said first and second coupling elements are completely coupled, said inner end extending at a substantial angle relative to said outer end so that said inlet opening is located at a substantial distance above the outlet opening of the tank when said outer end extends through the outlet opening of the tank and is rotated about said axis to a position where said inner end extends from said outer end at an upward angle, and

(d) means for preventing said rotation about said axis and for forming a seal between said feed tube and said first and second coupling elements when said first and second coupling elements are connected together for complete coupling.

4,682,797

CONNECTING ARRANGEMENT WITH A THREADED SLEEVE

Knut Hildner, Schriesheim, Fed. Rep. of Germany, assignor to Friedrichsfeld GmbH Keramik-und Kunststoffwerke, Mannheim, Fed. Rep. of Germany

Filed Jun. 25, 1986, Ser. No. 878,247

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523388

Int. Cl.[4] F16L *47/00*

U.S. Cl. 285—40 **25 Claims**

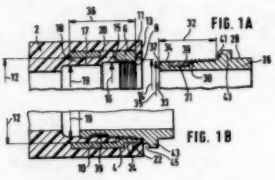


FIG. 1A

FIG. 1B

1. A connecting arrangement between a threaded sleeve of synthetic plastic material and a tube portion having a pipe thread thereon, wherein said threaded sleeve comprises an insert nut with an internal thread and an inner synthetic plastic ring which is engaged by the pipe thread of said tube portion, wherein said tube portion comprises a supplemental sealing ring, and wherein said synthetic plastic ring comprises a first sealing region within said insert nut spaced from an axial end face of said plastic ring and having an inner diameter smaller than the outer diameter of said pipe thread on said tube portion, and a second sealing region within said insert nut axially adjoining said first sealing region through a radial step and having an inner diameter smaller than the inner diameter of said first sealing region and smaller than the outer diameter of said sealing ring, said pipe thread of said tube portion sealingly engaging said first sealing region, and said sealing ring of said tube portion sealingly engaging said second sealing region of said synthetic plastic ring when said tube portion is connected to said threaded sleeve.

4,682,798

HOSE COUPLING

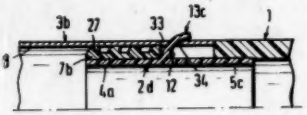
Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 691,902, Jan. 16, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 887,236

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401902; Dec. 8, 1984, 3444817

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—174 **20 Claims**



1. A coupling comprising a pipe having a first end portion; a hose having a second end portion; a tubular connector having a first section surrounded by said first end portion and a second section in sealing engagement with said second end portion, said second section being arranged to share axial movements of said second end portion; a sealing element interposed between said first section and said first end portion to establish and maintain a fluidtight seal therebetween while permitting at least some axial movement of said first end portion and said first section relative to each other; and at least one latching device for releasably locking said connector to said pipe, said latching device including a mobile first portion which is rigid with said connector and a second portion which is movable into and from engagement with said pipe, said first end portion having an opening and said latching device extending into said opening.

4,682,799

LATCH LOCK MECHANISM

Graham J. Luker, Arncliffe, Australia, assignor to Efco Manufacturing Company Pty, Limited, Australia

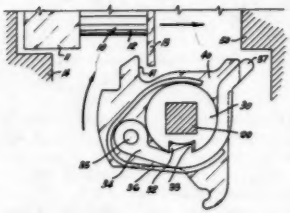
PCT No. PCT/AU84/00213, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/01771, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 19, 1984, Ser. No. 758,673

Claims priority, application Australia, Oct. 19, 1983, PG1926

Int. Cl.[4] E05C *21/00*

U.S. Cl. 292—169.15 **7 Claims**



1. A latch lock comprising:

a latch bolt connected for movement between a latching position and a retracted position,

a first part connected to be rotated by a door handle,

a second part connected to drive said latch bolt between said positions, and

clutch means connected between said first and second parts for transmitting rotation of said first part by the door

handle to said second part to move said latch bolt to the retracted position when engaged and allowing free rotation of said first part by the door handle when disengaged.

4,682,800

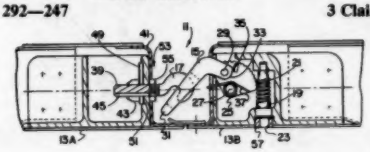
LATCH ASSEMBLY

Charles B. Lovelace, Jr., Upland, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Continuation of Ser. No. 550,827, Nov. 14, 1983, abandoned. This application Jun. 25, 1985, Ser. No. 748,649

Int. Cl.⁴ E05C 5/02

U.S. Cl. 292—247 **3 Claims**



1. An adjustable over-center latching assembly having an open and a closed position comprising:

(a) a manually operated worm shaft provided with a worm, said shaft being rotated in a first direction to move said assembly to an open position and in a second direction to move said assembly to a closed position;

(b) a segmented gear meshing with and operated by said worm, said segmental gear having a first shaft defining a first pivot axis about which said gear rotates;

(c) a latching member pivotally connected to said segmental gear by a second shaft defining a second pivot axis about which said latching member pivots;

(d) engaging means at the distal end of said latching member and a shoulder at the proximal end of said latching member;

(e) a lug on the face of said segmental gear for engaging said shoulder of said latching member as said segmental gear is rotated to said open position;

(f) biasing means for biasing said latching member towards said closed positon;

(g) a keeper for engagement with and disengagement from said latching member; and

(h) adjusting means for adjusting the distance of the latch keeper relative to said latching member;

whereby rotation of said manually operated worm shaft in said first direction causes said segmental gear to pivot about said first pivot axis to move said second shaft over dead center of said first shaft to thereby begin to release the load on said keeper, such that continued rotation of said manually operated shaft in said first direction relieves all of the link load and causes said lug to engage said shoulder of said segmental gear thereby overcoming the bias of said biasing means and rotating said latching member about said second shaft and out of engagement with said keeper.

4,682,801

ELECTROMAGNET ACCESS CONTROL CIRCUIT

Robert C. Cook, Redondo Beach, and Sasson Toeg, Beverly Hills, both of Calif., assignors to Securitron-Magnalock Corp., Torrance, Calif.

Filed Aug. 31, 1984, Ser. No. 646,626

Int. Cl.⁴ E05C 17/56

U.S. Cl. 292—251.5 **16 Claims**

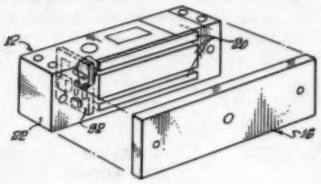
1. A high speed electromagnetic door control circuit comprising:

an electromagnet lock assembly means for holding a door closed solely by magnetic force, said electromagnetic lock assembly means including a strike plate or armature and electromagnet means for exerting a pull in the order of 800 pounds or more on the strike plate, said electromagnet lock assembly including means for mounting said strike plate and the electromagnet means on a door and in a mating location on a door frame, respectively, with the strike plate and the electromagnet means directly engaging one another as the door is swung closed;

high speed double-throw, double-pole relay switch means for alternately connecting said electromagnet to a first or a second circuit, said relay switch means having a speed of operation in the order of a few milliseconds or less;

means for supplying rectified current to said electromagnetic means in one direction through said first circuit;

a large capacitor means for discharging through said electromagnet means in the opposite direction via said second circuit to fully cancel out the residual magnetism which would otherwise be present after turning said electromagnet off;



means for charging said large capacitor means up to the voltage applied to said electromagnet means when said electromagnet means is being energized through said first circuit; and

circuit means for operating said relay switch means to switch said electromagnet means from said first circuit to said second circuit within a few milliseconds from the time when the power to the system is cut off;

whereby an opposite voltage from said capacitor means equal in magnitude to that normally applied to said electromagnet means, is applied to the electromagnet means to fully reverse the magnetic domains included in it and permanently prevent residual magnetism build-up.

4,682,802

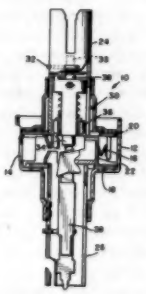
LOCK MECHANISM AND A SPRING AND CAM ASSEMBLY THEREFOR

Jon M. Smallegan, San Mateo, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Oct. 10, 1985, Ser. No. 785,987

Int. Cl.⁴ E05B 9/04

U.S. Cl. 292—337 **8 Claims**



1. A lock mechanism comprising:

(a) inside and outside spindles;

(b) a lock plunger assembly movably disposed within said

inside spindle between locked and unlocked dispositions thereof;

(c) a spring and cam assembly within said outside spindle for moving said lock plunger assembly from said locked to said unlocked disposition;

(d) a knob catch coupled to said outside spindle, and retractable thereinto, for releasably latching a knob to said outside spindle;

and means disposed within said outside spindle for obstructing said catch to prevent retraction thereof;

wherein said obstructing means is movably disposed, within said outside spindle, between a first positioning thereof in which it is obstructively in traverse of said knob catch to prevent retraction of the latter, and a second positioning thereof in which it is displaced from said knob catch; and

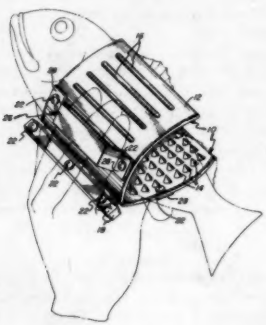
said assemblies comprise means cooperative for moving said obstructing means from one of said first and second positionings to the other thereof.

4,682,803

FISH TONGS

Kenneth C. Andrews, 905 Burnside Ave., East Hartford, Conn. 06108

Filed Jun. 19, 1986, Ser. No. 876,128
Int. Cl.[4] B25G *7/12*
U.S. Cl. 294—25 **5 Claims**



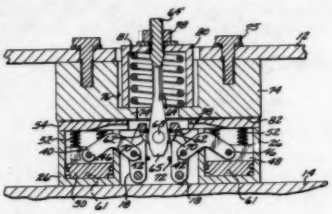
1. A hand-held, pincer-like device for assisting in grasping a fish, comprising: a pair of substantially identical rigid panels connected to one another along one edge by a hinge member and freely pivotable thereabout, said panels having friction-enhancing elements on the interior surfaces thereof and being curved to conform generally to the body of a fish held therebetween, said hinge member being comprised of a pair of relatively rigid bar portions and flexible web sections, one of said web sections connecting an associated one of said bar portions to one of said panels, each of said connected bar portions, web sections and panels being integrally formed as a single piece from a synthetic resinous material; and engaging means on both of said panels adapted to overlie and engage the thumb and fingers of one of the user's hands thereunder with said hinge member disposed along his palm, said engaging means comprising a laterally extending, relative rigid strip on the exterior of each of said panels, each of said strips being spaced transversely from said hinge member and having an elongated central section spaced from the surface of said panel to receive the ends of the user's thumb and fingers inserted thereunder, whereby said panels can be displaced from one another to open said device by a spreading action of the user's thumb and fingers.

4,682,804

RELEASABLE COUPLING ASSEMBLY

William B. Palmer, Palos Verdes Estates, and Henry Fink, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 23, 1984, Ser. No. 603,042
Int. Cl.[4] B64D *1/12;* **B66C** *1/28*
U.S. Cl. 294—82.26 **17 Claims**



1. A releasable coupling assembly for controlled retention and release of a releasable structure with respect to a base structure, comprising:

a pair of latches mounted with respect to the base structure in spaced relation and for pivoting movement about generally parallel axes;

a locking shaft mounted with respect to the releasable structure and having an outboard end for projection from the releasable structure to a position generally between said latches;

a pawl mounted generally at the outboard end of said locking shaft for rotation about an axis generally in parallel with the rotational axes of said latches, said pawl supporting a pair of tabs projecting generally in opposite directions for respective locking engagement with said latches when the shaft outboard end is positioned generally therebetween;

means for normally retaining said latches in locked positions for locked engagement with said tabs and for moving said latches to unlocked positions disengaged from said tabs; and

means for biasing said locking shaft toward a normal position with the outboard end thereof retracted from a position generally between said latches, thereby urging said pawl to rotate when only one of said latches is moved to the unlocked position, the rotation of said pawl disengaging the remaining engaged tab and allowing the releasable structure to separate from the base structure.

4,682,805

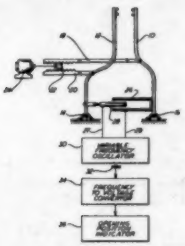
GRASPING FINGER POSITION SENSOR FOR A ROBOT SYSTEM

Robert W. Reynolds, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 18, 1986, Ser. No. 830,163
Int. Cl.[4] B25J *15/08, 19/02*
U.S. Cl. 294—86.4 **7 Claims**

1. In a robot system having at least one finger element which is movable in opposition to at least one cooperating finger element to grasp an object to be manipulated, a drive mechanism coupled to said movable finger element, a position sensing means for sensing the position of said movable finger element in relation to said cooperating finger element, said position sensing means comprising a variable reactance device including two cooperating reactance elements, at least one of said reactance elements being movable with respect to the other one of said reactance elements and being mechanicaly coupled to said movable finger element for movement therewith, the other one of said reactance elements being mechanically coupled to said cooperating finger element, the relative movement between said reactance elements being effective to vary the

reactance of said variable reactance device, an oscillator circuit connected with said variable reactance device, the frequency of said oscillator circuit being variable in response to



the variation in the reactance of said variable reactance device to thereby provide a frequency output signal which represents a measure of the position of said movable finger element with respect to said cooperating finger element.

4,682,806

QUADRUPLE GRIPPER

Bradley S. Thomas, Plymouth, and David J. Kargetta, Orlando, both of Fla., assignors to General Electric Company, Charlottesville, Va.

Filed Jan. 2, 1985, Ser. No. 688,214
Int. Cl.[4] B66C *1/00*
U.S. Cl. 294—88 **6 Claims**

1. A quadruple gripper for attachment to a wrist flange of an industrial robot, the gripper comprising:

a central base for mounting to the wrist flange;

first and second pairs of carriage rods attached to and extending from opposing sides of said base;

first and second symetrically arranged carriage assemblies mounted on said carriage rods, each of said carriage assemblies including a carriage member having a substantially flat floor portion and a pair of linear bearings attached to said floor portion and having apertures for slidably receiving a corresponding one of said carriage rods whereby said carriage assemblies are enabled to slide longitudinally of said rods;

first and second pairs of grippers, each of said grippers being mounted to a corresponding one of said carriage assemblies; and

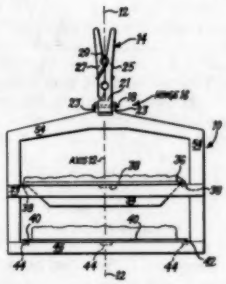
actuator means for slidably moving each of said carriage assemblies over the extent of said carriage rods whereby each gripper of a pair of grippers can be positioned for manipulation of a component at any point within the extent of said rods.

4,682,807

BAKED GOODS COOLING FRAME

Edward P. Mulligan, 310 Weeks St., Bennington, Vt. 05201

Filed Mar. 31, 1986, Ser. No. 846,014
Int. Cl.[4] A47G *19/08*
U.S. Cl. 294—161 **6 Claims**



1. A baked goods cooling frame comprising:

(a) at least one holding means for holding one baking plate containing hot baked goods;

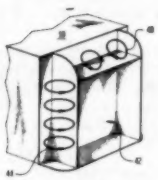
(b) a handle means, connected to said at least one holding means, for pendently attaching to and suspending said holding means from an approximately horizontally-mounted elongated element, said handle means having a spring loaded clamp for being clamped over and broadly gripping said elongated element, said handle means including a hinge means for hingedly connecting said holding means to said handle means, said hinge means including a hinge pin that is orthogonal to the direction of an elongated element to which said clamp may be attached so that said plate is held in a horizontal position regardless of the degree by which said elongated element deviates from an exactly horizontal position.

4,682,808

VEHICLE DRAG REDUCER

Alan J. Bilanin, 62 Battle Rd., Princeton, N.J. 08540

Filed Jul. 24, 1985, Ser. No. 758,405
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S **16 Claims**



1. An apparatus for reducing drag at the trailing end of a blunt body having a front end, a trailing end, a top surface, and a first and a second sidewall surface, said apparatus comprising:

first vortex capturing means connected to said trailing end for capturing and stabilizing a first vortex having an axis substantially parallel to the plane of said first sidewall surface, said first vortex capturing means including a first panel means attached to said trailing end and having a long axis substantially parallel to the plane of said first sidewall surface;

second vortex capturing means attached to said trailing end for capturing a second vortex having an axis substantially

parallel to the plane of said second sidewall surface, said second vortex capturing means including a second panel means attached to said trailing end and having a long axis substantially parallel to the plane of said second sidewall surface;

third vortex capturing means connected to said trailing end for capturing a third vortex having an axis substantially parallel to the plane of said top surface, said third vortex capturing means including a third panel means attached to said trailing end and having a long axis substantially parallel to the plane of said top surface; and,

fourth panel means attached to the lower portion of said trailing end and having a long dimension substantially parallel to the plane of said top surface, said fourth panel means defining one end of said first and second vortex capturing means.

4,682,809

CAR BODY

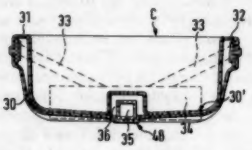
Heinrich Huss, Liebigstrasse 2, D 6054 Rodgau 6, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,292

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444377

Int. Cl.[4] B62D *29/04*

U.S. Cl. 296—31 P **20 Claims**



1. An extremely torsion-resistant body construction for a small, lightweight passenger vehicle comprising:

an elongated shell of highly impact resistant plastics material, said shell having a continuous base and upwardly extending side walls integrally formed with said base;

a metal chassis secured to said shell, said chassis including weight receiving and stiffening means disposed between opposite side walls of and in contact with said base of said shell, said weight receiving and stiffening means comprising an open metal box having a bottom, upstanding walls and an opening between upper ends of said upstanding walls, said bottom of said box being secured to said base of said shell to form an integrated composite structure therewith; and

wheel support means secured to said chassis and extending outwardly through said opposite side walls of said shell for supporting wheels having axes of rotation which lie in a vertical plane passing through said box.

4,682,810

WHEELED STRETCHER IN WHICH THE PLANE ON WHICH THE PATIENT LIES IS ADAPTABLE IN HEIGHT

Michel Zarka, Tours, France, assignor to Contact Securite - Societe d'Exploitation, Villeneuve La Garenne, France

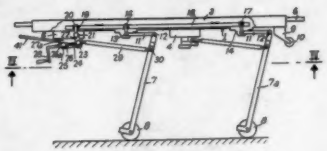
Filed Oct. 16, 1985, Ser. No. 787,907

Claims priority, application France, Oct. 18, 1984, 84 15998

Int. Cl.[4] B62H *3/02*

U.S. Cl. 296—20 **15 Claims**

1. A wheeled stretcher in which the plane on which the patient lies is adjustable in height, comprising a frame on which is fixed a top element and which rests on the ground via two pairs of inclined legs provided with wheels, each pair of legs is connected to the frame by at least a connecting rod and a bar articulated by one of their ends, on the frame and by their other end, on the pair of legs so as to form a deformable quadrilateral, said connecting rod being connected to means for adjusting the top element in height, and said bar being connected to means for controlling the inclination of the legs.



4,682,811

VAN BODY USED WITH CONTAINER CAR, FREIGHT CAR AND TRUCK

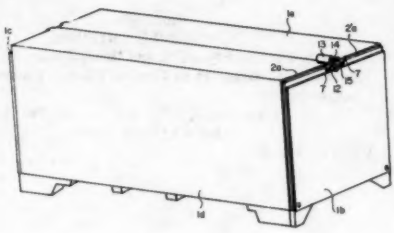
Yukito Ooguro, Fukuyama, Japan, assignor to Sanyo Mikawa Body Corp., Japan

Filed Nov. 5, 1985, Ser. No. 795,143

Claims priority, application Japan, Nov. 5, 1984, 59-233886; Feb. 19, 1985, 60-31714

Int. Cl.[4] B60J *7/16*

U.S. Cl. 296—181 **3 Claims**



1. A van body comprising opposing inverse L-shaped side frames located at the front and rear of a floor, the upper ends of the opposing inverse L-shaped frames contacting each other in the top center and separated from each other when closing and opening, the lower ends thereof being pivotally connected to the front and back of said floor and shields bridging the inverse L-shaped frames on the same side, said shields being pivotally connected to the upper ends of the inverse L-shaped frames and means for closing and opening the inverse L-shaped frames and shields to effect the vane opening and closing operations at the upper edges.

4,682,812

MOTOR VEHICLE BODY SIDE WALL

Oskar Hurten, Cologne; Hans Vogt, Overath, and Paul Stutenkemper, Pulheim, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 11, 1986, Ser. No. 873,037

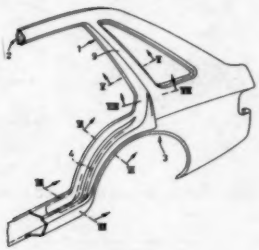
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521607

Int. Cl.[4] B62D *25/08*

U.S. Cl. 296—195 **6 Claims**

1. A body side wall for motor vehicles of the type including a rear side door opening bounded in part by the vehicle roof, the vehicle floor sill and a rear pillar which essentially comprises a side wall inner panel, a side wall outer panel, and reinforcement panel means defining a box support positioned adjacent the front part of the rear wheel housing, characterized in that the reinforcement panel means comprises a one-piece reinforcement panel formed to have a U-shaped cross-section

and positioned adjacent the door opening, extending from the vehicle roof frame along the rear pillar and the front part of the wheel housing to the sill portion of the vehicle body floor, the reinforcement panel being connected to the side wall inner panel and the side wall outer panel to form a continuous box



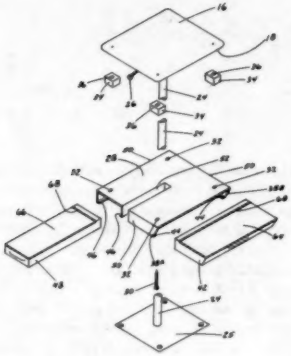
support extending from the roof frame to the sill; and that in the region of the front part of the wheel housing the one-piece reinforcement panel forms two box supports extending in parallel, partly curvilinear fashion along the periphery of the wheel housing through attachment to the side wall outer panel.

4,682,813

UNDERSEAT TACKLE CONTAINER

Robert D. Fohr, 9100 Racine Ave., and Jeffrey E. Tieze, 3529-90th St., both of Sturtevant, Wis. 53177

Filed May 2, 1986, Ser. No. 858,690
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—192 **20 Claims**



1. A tackle container assembly mountable below a deck-mounted pedestal seat having a seat lower surface and a pedestal plate centrally mounted thereon with a pedestal post extending therefrom, comprising:

an upper principal member extending on either side of said pedestal, said upper principal member having a lateral opening extending from one edge toward the center of the upper principal member to accommodate the pedestal;

means to secure the upper principal member with respect to the seat lower surface;

means depending from the upper principal member on either side of said pedestal to support container means on either side of said pedestal in position spaced from the deck,

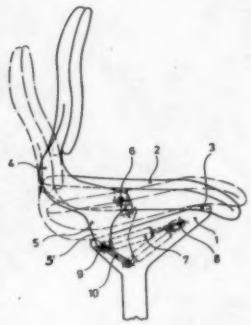
whereby substantial accessible storage space is available while still allowing the feet of someone in the seat to readily be placed beneath the seat on the deck against the pedestal post.

4,682,814

TILTING SEAT AND BACK CHAIR, PARTICULARLY TILTING DESK CHAIR

Eckard Hansen, Margrethen, Switzerland, assignor to Provenda Marketing AG, Herisau, Switzerland

Filed Nov. 1, 1984, Ser. No. 667,278
Int. Cl.[4] A47C *1/032*
U.S. Cl. 297—300 **21 Claims**



1. Chair having a tilting seat and tilting back, especially tilting desk chair, including

a support structure (1);

a seat (2) having a forward and a rear edge zone;

front connection means (3) pivotably connecting the forward edge zone of the seat to the support structure (1);

a chair back (4) having an upper portion and a lower portion;

an attachment arm (5) extending from the lower portion of the chair back (4) to a zone beneath the seat, and having two spaced pivot connection means (6, 9),

a first pivot connection means (6) being located adjacent to or below the seat and positioned forwardly of a plane containing the upper portion of the chair back and pivotably connecting the attachment arm (5) and the seat (2), a second pivot connecting means (9) being located below the level of the seat and below said first connection means coupled to a guide means;

said guide means (10, 10') coupling the attachment arm (5) to the support structure (1) for changing the inclination of the chair back (4) with respect to the support structure, while simultaneously changing the position of the seat (2) with respect to the support structure (1);

lockable positioning-and-force means (7) attached to the support structure (1) and coupled to the arm (5) in the region of the second pivot connection means (9) and selectively providing a force on the seat (2) and on the chair back (4) to bias the back in an upright position, or permit locking of the seat and the chair back in a position of inclination selected by a user,

and wherein the guide means (10, 10') is coupled to the attachment arm (5) and hence to the chair back (4) at a position spaced from said first pivot means (6),

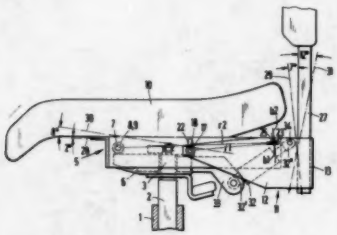
said guide means further being coupled to the support structure (1) for guiding the movement of the attachment arm (5) and hence relating, via said first pivot means (6), conjoint tilting movement of the seat (2) and of the chair back (4) as determined by the guide means,

the attachment arm (5) forming a rigid connection between said first and said second spaced pivot connection means (6, 9) and providing a coupling between the chair back (4) and the seat (2) while permitting said conjoint tilting movement of the seat and of the chair back.

4,682,815
CHAIR

F. Martin Steifensand, Sperbersloher Str. 124, D-8501 Wendelstein, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,156
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 8511034[U]
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—300 **12 Claims**



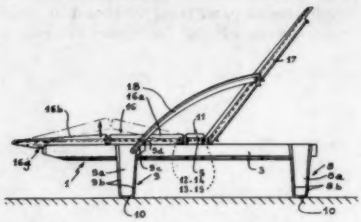
1. A chair comprising:
(a) a pedestal base;
(b) a support member mounted on the pedestal base;
(c) a seat carrier connected at a forward end portion thereof to the support member for pivotal movement about a stationary first horizontal axis;
(d) a backrest carrier connected to the support member for pivotal movement about a second horizontal axis, and to a rearward end portion of the seat carrier for pivotal movement about a third horizontal axis;
(e) the seat and backrest carriers being pivotable together relative to the support member within a pivotal range and in a direction between a work position and a rest position, wherein the backrest carrier traverses a greater pivot angle between the work and rest positions than the seat carrier;
(f) force storage means disposed between the support member and the backrest carrier for biasing the backrest carrier in an upward and forward direction towards the work position; and
(g) the first, second and third horizontal pivot axes being disposed in parallel to each other and substantially within a single plane, whereby during pivotal movement of the seat and backrest carriers relative to the support member within the pivotal range, a first radius described between the second and third horizontal axes and a second radius described between the first and third horizontal axes define substantially congruent circular arcs at the third horizontal axis.

4,682,816
EASY CHAIR

Henry Massonnet, FR-01760 Nurieux-Volognat, France

Filed Jul. 7, 1986, Ser. No. 882,262
Claims priority, application France, Jul. 9, 1985, 85 10691
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—359 **9 Claims**

1. An easy chair comprising a generally horizontal frame having side and first and second end portions, first and second pairs of depending legs extending from said side portions of said frame, said first pair of said legs being positioned adjacent said first end portion and said second pair of said legs being spaced toward said second end portion of said frame, a seat means extending between said side portions of said frame and being fixedly secured thereto, a backrest means pivotally connected to said frame, a pair of armrests having first and second end portions, said first end portions of said armrests being pivotally connected to said backrest means, said second ends of said armrests extending into contact with said second pair of legs, support means associated in said second pair of legs for adjustable supporting said second ends of said armrests therein,

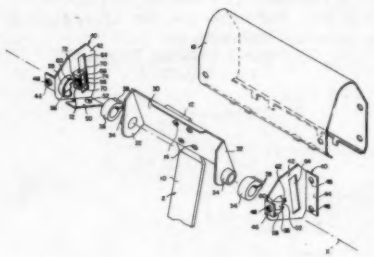


and leg rest means mounted to said frame and spaced from said backrest means.

4,682,817
ADJUSTABLE HEAD RESTRAINT FOR VEHICULAR SEATS

Elmer C. Freber, St. Louis, Mo., assignor to Marquette Tool & Die Company, St. Louis, Mo.

Filed Jan. 24, 1985, Ser. No. 694,613
Int. Cl.[4] A47C *7/36*; B60N *1/00*
U.S. Cl. 297—408 **17 Claims**



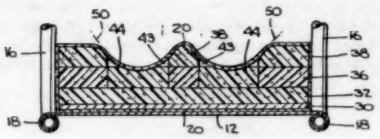
1. A head restraint for use on the backrest of a seat for an automotive vehicle, said head restraint comprising: a generally upright post; a cushion supported on the post; and pivot means located between the post and the cushion for connecting the cushion with the post such that the cushion can pivot on the post about a generally horizontal axis of rotation, the pivot means including a first member attached firmly to the post, a second member in the cushion, and a split bushing located generally between the first and second members, one of the members having a spindle attached rigidly to and projecting from that member concentric to the axis of rotation such that it does not rotate relative to the post, the split bushing being around the spindle and having a pair of lugs which are separated at the split in the bushing such that the bushing will contract slightly when the lugs are urged together, the other member having a seat and a clamp which together receive the bushing and prevent the other member from moving radially or turning with respect to the bushing, the clamp being located externally of both the bushing and its rugs and having clamping elements between which the lugs of the bushing fit with the clamping elements being against the lugs, the clamp also having a screw located remote from the lugs on the bushing for urging the clamping elements together when the screw is turned in the correct direction, whereby the bushing contracts to increase the frictional resistance between the bushing and spindle so that a greater torque is required to change the angular position of the cushion on the post.

4,682,818

PRESSURE DISTRIBUTION PAD ASSEMBLY FOR WHEELCHAIRS

Theodore R. Morell, 59-29 174th St., Fresh Meadows, N.Y. 11365

Filed Aug. 14, 1986, Ser. No. 896,631
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—452 **14 Claims**



1. A modifiable pressure distribution pad assembly for a wheelchair comprising:

(A) a bottom pad of resilient foam material of high density;

(B) at least one upper pad of resilient foam material of an intermediate density less than said high density, said upper pad being supported by said bottom pad and having at least one cutout defining an opening therethrough;

(C) filler foam material frictionally mounted as an insert in at least one of said openings of at least one of said upper pads and removable therefrom, said filler foam material having a low density less than said intermediate density; and

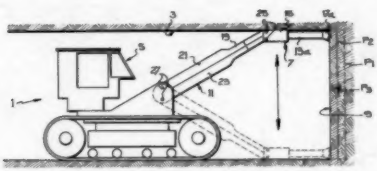
(D) a cover enclosing said pads, said cover permitting removal of said upper pad and associated filler foam material therefrom so that said filler foam material in one opening can be separated from said upper pad and replaced in said one opening by filler foam material of a different density prior to return of said upper pad and associated filler foam material to said cover.

4,682,819

METHOD AND APPARATUS FOR DRILLING HARD MATERIAL

Roger Masse, 131, rue Roussin, Thetford Mines, Quebec, Canada G6G 1N6

Filed Mar. 12, 1984, Ser. No. 588,741
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.[4] E21C 25/00, 41/00
U.S. Cl. 299—10 **9 Claims**



1. A method for impact drilling a hole in a front of hard material such as rock, comprising the steps of:

positioning a plurality of impact tools having rock fragmenting heads parallel to one another in a line;

incrementally spacing adjacent ones of the impact tools such that the impact tools are longitudinally incrementally spaced to extend different distances toward the front;

laterally spacing the impact tools in said line by a distance greater than an area of direct impact of the rock fragmenting heads;

actuating the impact tools as incrementally spaced and reciprocating the impact tools back and forth substantially perpendicular to said line;

advancing the impact tools longitudinally toward the front during said reciprocating, and thereby fragmenting the hard material by striking the front directly with the impact tools along a plurality of spaced-apart paths extending in parallel lines of incrementally different depths in the front of hard material, each of the impact tools fragmenting a path by direct impact with the front across a lateral width along the line with a gap free of direct impact remaining between the impact heads and between adjacent paths followed by the impact heads; and,

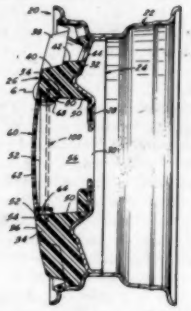
simultaneously fragmenting material at the gap by shear of said hard material between said paths, due to said incremental spacing.

4,682,820

VEHICLE WHEEL WITH AN ORNAMENTAL PLASTIC OVERLAY

Robert J. Stalter, Bowling Green, Ohio, assignor to Motor Wheel Corporation, Ohio

Filed Oct. 16, 1985, Ser. No. 788,156
Int. Cl.[4] B60B 7/02
U.S. Cl. 301—37 P **12 Claims**

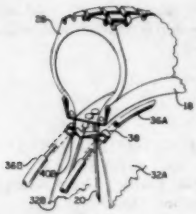


1. In a composite styled wheel including in combination a metallic portion comprising a wheel mounting disc and a rim secured to said disc and adapted to receive a tire thereon, and a plastic portion comprising an ornamental overlay disposed adjacent and covering at least part of the outboard face of said metallic portion, said overlay comprising a body of plastic material permanently affixed to said metallic portion, the outboard face of said body being exposed to view from the outboard side of said wheel having a contour differing from the contour of the covered part of the outboard face of said metallic portion and adapted to provide decorative contour over at least part of the metallic portion of said wheel, said covered part of said metallic portion comprising said disc and said disc having a central aperture and wheel mounting fastener holes therein, said overlay having aperture means including an internal annular surface registering coaxially with said central aperture and holes in said disc and defining a central cavity in said body adapted to receive wheel hub and mounting parts therein, the improvement wherein said aperture means comprises retainer means secured to said body and being spaced radially outwardly from said cavity annular surface, said overlay material engulfing said retainer means so as to at least partially embed said retainer means in said overlay to thereby hide said retainer means from view and assist in securement thereof to said body, said body and said retainer means having cooperative detent means disposed in the vicinity of the outboard face of said body encircling the outboard entrance to said body cavity and adapted to yieldably releasably engage a center ornament hub cap or the like for removable attachment of the same to said body to close the outboard end of said body cavity.

4,682,821
BICYCLE WHEEL COVER ASSEMBLY

Steven L. Strazis, Apex, N.C., assignor to Chris Arendt, Raleigh, N.C., a part interest

Filed Sep. 30, 1986, Ser. No. 913,497
Int. Cl.[4] B60B *7/00*; B60R *13/00*
U.S. Cl. 301—37 R **14 Claims**



1. A wheel cover assembly for spoked wheels of the type including a center axle and an outer rim supported from said axle by means of a plurality of spokes, said assembly comprising:

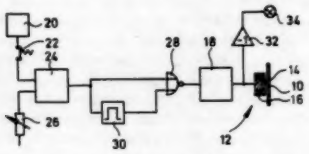
a pair of discs sized to cover each side of the spokes on a spoked wheel and each having a center axle opening therein for an axle to extend through; and

attachment means for attaching said pair of discs together through said spokes, said attachment means including a plurality of apertures defined in spaced-apart relationship around the perimeter of each of said pair of discs so that said discs can be positioned on a spoked wheel with the apertures in one disc in substantial paired alignment with the apertures in the other disc, a plurality of elastomeric tension elements each being adapted to be extended between said discs and through a pair of said aligned apertures, and a pair of annular retainer members each being adapted to be positioned adjacent the apertures on the outer surface of a respective one of said pair of discs and to engage and retain said elastomeric tension elements, said pair of retainer members thereby urging said corresponding pair of discs inwardly into operative engagement against said spoked wheel.

4,682,822
ELECTRONIC CARRIAGE BRAKE FOR A DRAWING MACHINE

Gerhard Brecht, Stuttgart, and Dieter Sackmann, Marbach, both of Fed. Rep. of Germany, assignors to Marabuwerke Erwin Martz GmbH & Co, Tamm, Fed. Rep. of Germany

Filed Dec. 17, 1984, Ser. No. 682,327
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347689
Int. Cl.[4] F16D *71/04*
U.S. Cl. 303—20 **15 Claims**



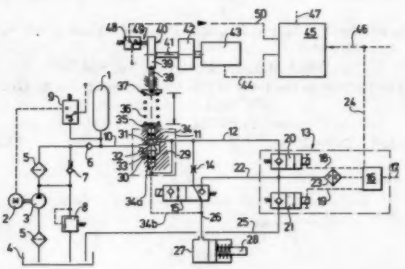
1. An electronic carriage brake intended for a drawing machine and provided with an electrically controllable brake magnet and with a control system which is associated with the brake magnet and comprises:

a position sensor which co-operates with the carriage, a unit for inputting a desired position nominal value, a comparator to which output signals from the position sensor and from the input unit are applied, and a power stage which is connected to an output of the comparator for driving the brake magnet, characterised in further comprising a monostable trigger circuit (**30**), a clock terminal of which receives the output signal from the comparator (**24**), and an OR element (**28**) which combines an output signal from the monostable trigger circuit (**30**) and the output signal from the comparator (**24**), both of which output signals serve for triggering the power stage (**18**), an output of the OR element (**28**) being connected to an input terminal of the power stage (**18**).

4,682,823
ELECTRICALLY CONTROLLED BRAKE FOR VEHICLES, ESPECIALLY RAIL VEHICLES

Winfried Hommen; Georg Stäuble, and Tiberius Wieser, all of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse AG, Munich, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,267
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432782
Int. Cl.[4] B60T *8/18*
U.S. Cl. 303—22 R **3 Claims**



1. Electrically controllable brake for vehicles, particularly rail vehicles, with a control device (**13**) controlled by an electrical braking demand signal for producing a braking force corresponding to the braking demand signal, wherein the control device comprises an emergency braking system, (**15**) for the introduction of maximum braking power, and with a pressure limiting valve (**11**) controlled by a vehicle load signal corresponding to the vehicle load for vehicle load dependent limitation of braking power, wherein the vehicle load signal representing an electrical signal value through control electronics (**45**) controls a servomotor (**43**), which in turn controls the axial position of a spring support (**37**) for a control spring (**36**) controlling said pressure limiting value (**11**) through a gear (**42**) and an adjustable cam (**38, 40**) downstream of said gear, and wherein said adjustable cam (**38,40**) controls a signal device (switch **48**) which, in a predetermined cam position transmits an adjustment signal to said control electronics (**45**).

4,682,824

BRAKING PRESSURE GENERATOR FOR SLIP-CONTROLLED BRAKE SYSTEMS OF AUTOMOTIVE VEHICLES

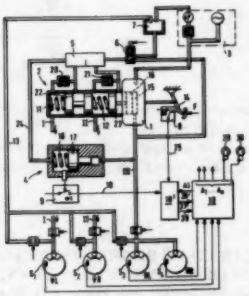
Jochen Burgdorf, Offenbach-Rupenheim, and Lutz Weise, Mainz, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,520

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427380

Int. Cl.[4] B60T *8/02*

U.S. Cl. 303—92 4 Claims



1. A braking pressure generator for slip-controlled brake systems of automotive vehicles comprising in combination a master cylinder and booster actuated by a brake pedal, a brake slip controller, dynamic and static pressure fluid circuits respectively connected to said booster and said master cylinder, hydraulic pressure fluid being introduced and metered during braking with slip control into said static circuits from the dynamic circuits by way of valve means controlled by said controller and a prechamber connected to said master cylinder, said prechamber during braking without slip control is hydraulically connected by way of valve means with a pressure compensating reservoir and from which the hydraulically introduced pressure fluid is fed during slip control by way of check valves operably connected to said master cylinder into the static circuits, and comprising a differential pressure pilot valve including a piston which under the action of the differential pressure is axially slidable within a cylinder and which upon exceeding a differential pressure threshold actuates an alarm switch, wherein the differential pressure pilot valve (4) during braking actions with slip control as well as without slip control compares a pressure proportional to a brake pedal force in a booster chamber (15) within the dynamic circuit with the pressure in the prechamber (5) and actuates said alarm switch (9) when the pressure in the booster chamber (15) exceeds the pressure in the prechamber (5) by said predetermined differential pressure threshold,

including logic combining means wherein an on/off switching position output signal of the alarm switch (9) actuated by the differential pressure pilot valve (4) is logically combined with on/off switching position output signals of switches (8, 10) responding to brake actuation and to starting of the slip control, respectively,

wherein said logic combining means comprises a logic combining circuit providing first, second and third signal combinations,

wherein said first combination is indicative of simultaneous response of the switching on of the alarm switch (9) and the brake-actuating signal (switch 8) while the brake slip control signal is switched off or not put into operation,

wherein said second combination is indicative of simultaneous response of the brake-actuating signal (9) and the brake slip control signal switching on without the alarm switch (9) signal switching on; and,

wherein said third combination is indicative of simultaneous off-position of the brake-actuating signal (8) the alarm switch signal (9), and the brake slip control signal (10), and thereby recognized and evaluated as intact condition of the brake system, and that all other switching position signal combinations will trigger an error signal.

4,682,825

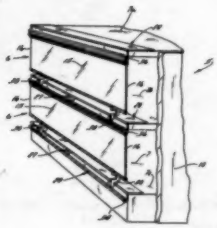
SECURITY DEVICE FOR POINT-OF-SALE DISPLAY RACK AND PRIMARILY STORE SHELVING

Louis J. Crosslen, Saukville, Wis., assignor to Frank Mayer & Associates, Grafton, Wis.

Filed Feb. 24, 1986, Ser. No. 831,817

Int. Cl.[4] A47F *3/024*

U.S. Cl. 312—42 11 Claims



1. Security means cooperable with a pair of vertically spaced shelves which have parallel lengthwise extending front edges and a lower one of which normally supports stacked substantially identical articles that are accessible substantially only from in front of said front edges, for preventing removal of more than a lowermost predetermined number of those articles at a time, said security means comprising:

A. a flat panel member having opposite substantially parallel top and bottom edges and opposite end edges and having

(1) a length between its end edges that is substantially equal to the length of said shelves and

(2) a height between its top and bottom edges that is equal to slightly less than the distance between said shelves minus the height of said predetermined number of said articles;

B. link means having upper and lower ends;

C. first connection means for so connecting the upper end of said link means with the upper one of said shelves as to provide for swinging of the link means about a link axis which is near and parallel to the front edge of that shelf;

D. second connection means connecting the lower end of the link means with the panel member for flatwise swinging of the panel member relative to the link means about a panel axis which is near and parallel to the top edge of the panel member and is spaced from and parallel to said link axis;

E. a bracket member securable to the lower one of said shelves and having an upwardly opening groove wherein a lower portion of the panel member is receivable to confine the panel member against swinging about said axes, the bottom of said groove being at an elevation for so supporting the panel member that the panel axis is in horizontally offset relation to the link axis; and

F. at least one of said members being sufficiently resilient to permit the link means to be swung about the link axis against yielding bias between a locked position in which the panel axis is rearwardly offset from the link axis and a releasing position in which the panel axis is forwardly offset from the link axis and from which the link means can be swung upward about the link axis to disengage the panel member from said groove and thus free the panel member to be swung forward and upward about the panel

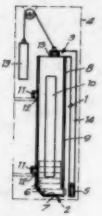
axis for unrestricted access to the space between said shelves.

4,682,826

ANTI-THEFT SHOP DISPLAY CASE

Jacques Mestdagh, Loverval, Belgium, assignor to Figos, Societe Anonyme, Belgium

Filed Jun. 18, 1985, Ser. No. 746,024
Claims priority, application Belgium, Dec. 6, 1984, 2/60560
Int. Cl.[4] A47F *1/00*
U.S. Cl. 312—42 **3 Claims**



1. An anti-theft shop display case assembly comprising:
(a) a display case;
(b) a plurality of horizontal supporting bars disposed within the display case;
(c) a plurality of rectangular-shaped magazines for containing supplies of vertically stacked articles, the magazines being displosable within and vertically removable from the display case;
(d) each magazine including a top opening for loading the articles therein, four vertical walls, a dispensing opening at the bottom of one vertical wall, and a plurality of hooks for engaging the supporting bars;
(e) the dispensing openings being positioned in a linear array when the magazines are disposed within the display case;
(f) a lockable closure including a vertically displaceable horizontal bar for preventing access to the dispensing openings;
(g) a locking means including a vertically displaceable locking bar for preventing vertical removal of the magazines, and a chassis carried by the display case coupling the horizontal and locking bars for joint vertical movement; and
(h) means for vertically displacing the chassis between an open position wherein access to the dispensing openings is permitted, and a closed position wherein the horizontal bar is disposed across the linear array of dispensing openings for preventing access thereto and the locking bar is disposed across the top openings of the magazines for preventing their vertical removal.

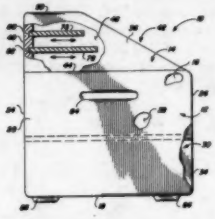
4,682,827

COMBINATION TOY BOX-DRAFTING TABLE

Eldon D. Woodward, 1118 E. Avenue J-2, Lancaster, Calif. 93534

Filed Aug. 26, 1985, Ser. No. 769,403
Int. Cl.[4] A47B *27/00*
U.S. Cl. 312—231 **11 Claims**

1. An improved combination toy storage box and drafting table, said box-table comprising, in combination:
(a) a storage box having interconnected upstanding front, rear and side walls and a generally horizontal closed bottom connected thereto and an open top defining a central storage space;
(b) a drafting table resting on said top of said box and releasably connected thereto, said table including a pair of spaced upraised sidewalls, and an upraised rear wall, interconnected thereto and to a closed top, said table having an open bottom and a central storage cavity, said table top including an upwardly and rearwardly sloped front drafting portion connected to an about horizontal rear portion, said entire table being dimensioned so as to be nestable within a portion of the central storage space of



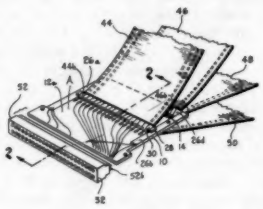
said box without prior disassembly of said entire table for transportation therein; and,
(c) access means in at least one of said box and table for access to at least one of said central storage space and storage cavity.

4,682,828

BUS BAR BRIDGED PC BOARD FOR TRANSITIONAL TERMINATION OF MULTIPLE CABLES AND METHOD

Douglas E. Piper, Greenville, and Michael D. Black, Mauldin, both of S.C., assignors to 501 Woven Electronics Corporation, Mauldin, S.C.

Filed Dec. 6, 1985, Ser. No. 806,347
Int. Cl.[4] H01F *4/66*
U.S. Cl. 439—92 **16 Claims**



6. A transitional printed circuit board for transitionally terminating a plurality of electrical transmission cables, each of which includes a plurality of ground and signal wires comprising:
a nonconductive electrical substrate;
said substrate having a connector end adapted for receiving a terminal connector, an opposed rear end, a first side integral with said connector and rear ends, and a second opposing side integral with said connector and rear ends;
a first ground plane formed on one side of said substrate adjacent the periphery of said substrate;
first electrical contact means for making electrical connection with the signal wires of a first electrical transmission cable;
second electrical contact means for making connection with the signal wires of a second electrical transmission cable;
electrical trace means interconnecting said first and second electrical contact means;
a plurality of electrical pads disposed across said substrate adjacent said connector end;
a second ground plane superimposed above said electrical trace means generally parallel to said substrate in a manner that shorting of electrical signals transmitted along said electrical trace means is effectively prevented.
electrical termination means formed on said substrate adja-

cent said connector end adapted for connection to said terminal connector; and

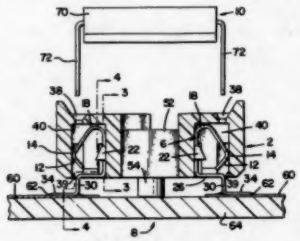
electrical trace means connecting said second land means and said electrical termination means.

4,682,829

SURFACE MOUNT SOCKET FOR DUAL IN-LINE PACKAGE

John P. Kunkle, Clemmons, and Donald W. McClune, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 13, 1985, Ser. No. 744,180
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—83 **6 Claims**



1. A multicontact surface mount dual in-line package socket for interconnecting a dual in-line circuit element package having a plurality of external leads, insertable into the socket, to the surface of a printed circuit board, to establish electrical and mechanical interconnection to surface mounting pads, having solder paste predeposited thereon, in a high temperature surface mount soldering operation, comprising:

a plastic insulative housing having a plurality of lead-receiving cavities arranged in two parallel rows and extending therethrough between an upper and a lower housing surface, each of said cavities communicating with said lower surface by a respective opening; and

a plurality of stamped and formed terminals, disposed in respective said lead-receiving cavities each said terminal having:

a first flexible cantilever section adjacent a first end thereof and disposed within a said lead-receiving cavity, the first section comprising means for establishing electrical contact to an associated lead of a circuit element package, received into the lead-receiving cavity from said upper housing surface;

a second terminal section contiguous with the first terminal section extending axially within the lead-receiving cavity along an inner wall thereof, the second section having terminal retention elements thereon in engagement with the insulative housing and comprising means to anchor the terminal in the lead-receiving cavity;

a third terminal section contiguous with the second terminal section, the second terminal section being between the first terminal section and the third terminal section, the third terminal section extending across and within said lower surface cavity opening of said cavity perpendicular to the second terminal section and towards the outer side of the housing;

a fourth terminal section contiguous with the third terminal section, the third terminal section being between the second terminal section and the fourth terminal section, the fourth terminal section extending perpendicular to the third terminal section and extending below said lower housing surface; and

a fifth terminal section adjacent the second end of the terminal and extending perpendicular to the fourth terminal section outwardly from said housing and spaced from said lower housing surface and parallel thereto, the fifth terminal section comprising means for establishing a solder connection to a corresponding surface mounting pad of a printed circuit board,

each second terminal section being anchored to said insulative housing by said terminal retention elements and each fifth terminal section being fixed to said printed circuit board by a solder joint providing two rigidly secured points after the package socket is secured to said printed circuit board with each said third terminal section being slightly smaller than said lower surface cavity opening so as to be free of interference therewith, and

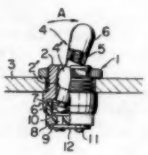
that portion of each said terminal between said terminal retention elements and said fifth terminal section including each third and fourth section comprises a compliant member flexible along two orthogonal axes and flexible in torsion about a third orthogonal axis parallel to said rows, each terminal section being formed by bending said terminal about an axis parallel to the plane of the stamped terminal blank to form a more compliant member along the two orthogonal axes, whereby said terminals can move to absorb the differential expansion between said printed circuit board and said plastic insulative housing without disrupting the solder connections between the fifth terminal sections and the corresponding surface mounting pads.

4,682,830

SWITCH TERMINAL

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 643,377, Aug. 23, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 851,074
Claims priority, application Japan, Aug. 26, 1983, 58-131842[U]
Int. Cl.[4] H01R *27/00*
U.S. Cl. 439—224 **5 Claims**



1. A switching terminal comprising

a cup-shaped insulating member;

a rotatable switch terminal member located on said insulating member and having means extending outwardly therefrom for electrically connecting said terminal member to an electric circuit;

means to obtain different orientations of said terminal member including

said switch terminal member having a first pair of diametrically opposing holes and a second pair of diametrically opposing holes spaced in an angular direction of approximately 90° from said first part of holes,

a stationary contact penetrating said insulating member through one hole of said pair of holes and electrically connected to said means for electrically connecting said switch terminal member to an electric circuit by way of said switch terminal member,

a projection formed on said insulating member through the other one hole of the same said pair of diametrically opposing holes;

a spring biased plunger on the opposite side of said cup shaped insulating member positioned to contact said stationary contact when the switching terminal is in a conducting position;

and means to complete the electrical circuitry of the switching terminal from said spring biased plunger

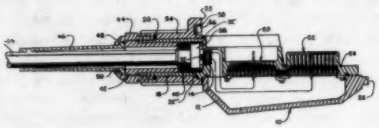
whereby said stationary contact and said projection can be received by a selected one of said pairs of diametrically opposing holes to obtain different orientations of said terminal member relative to said insulating member and a line of direction of operation of said plunger.

4,682,831

MULTIPLE-CONTACT CONNECTOR ASSEMBLY

William O. McNeel; Royel F. Montieth, and Stephen E. Scott, all of Houston, Tex., assignors to Litton Resources Systems, Inc., Alvin, Tex.

Filed Mar. 12, 1982, Ser. No. 357,459
Int. Cl.[4] H01R *25/00, 4/70*
U.S. Cl. 439—294 **5 Claims**



1. A hermaphroditic, multicontact connector half assembly for sealably receiving any one of a number of different multiconductor jacketed cables of divers diameters, said connector half assembly including a box-like case having walls, for receiving therewithin a set each of male and female connector contacts and a fanout of the individual wires of the multiconductor cable that are to be connected to said contacts, the connector-half assembly comprising:

a cable entry port in a first wall of the case for receiving an end of a multiconductor cable, the entry port including first locking means on the outer surface of the first wall and a hollow elongated neck having inner and outer walls surrounding the entry port and the first locking means;

an anchor molded to said cable near an end thereof, adapted for insertion in said neck, the anchor having a front face that bears a second locking means matable with said first locking means for engagement with said first locking means, said anchor including a rear collar having a fixed outer diameter regardless of the diameter of said cable;

a sphincter snugly seated around the collar of said cable anchor; and

means for compressing said sphincter to force said sphincter to expand radially in sealing engagement between the inner wall of said hollow neck and the rear collar of said anchor.

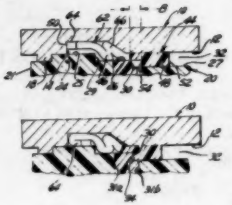
4,682,832

RETAINING AN INSERT IN AN ELECTRICAL CONNECTOR

Stephen Punako, Bainbridge; David O. Gallusser, Oneonta, both of N.Y., and Warren R. Williams, Jr., Montrose, Pa., assignors to Allied Corporation, Morris Township, N.J.

Filed Sep. 27, 1985, Ser. No. 781,156
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—589 **12 Claims**

1. In an electrical connector assembly of the type including a cylindrical shell having an annular groove in its inner wall, a cylindrical insert disposed within said shell and having an outer periphery encircled by said groove with the inner wall and the outer periphery being dimensioned so as to form an annular passageway extending coaxially therebetween, and retention means for retaining the insert within said shell, said retention means comprising a cylindrical retention member of deformable material including a scalloped forward end portion thereof interferencingly fit in the annular passageway between the shell and the insert, said retention means characterized in that a leading edge of each said scallop is curled backwardly and folded into overlapping relation onto itself whereby the curled overlapped scallops of the forward end portion are radially wedged interferencingly in the annular groove and in



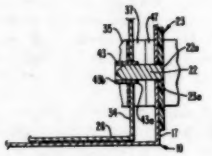
the annular passageway and lock the leading edges therewithin.

4,682,833

ALIGNMENT AND CONNECTION MECHANISM

Joerg U. Ferchau, Morgan Hill, and Victor D. Trujillo, Fremont, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 702,109, Feb. 15, 1985, abandoned. This application Aug. 21, 1986, Ser. No. 898,878
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—377 **4 Claims**



1. In an assembly, including a cabinet formed to have at least one drawer-receiving cavity, a drawer configured for removable insertion in the cavity, and at least a pair of connector parts respectively associated with the cabinet and the drawer, an alignment system to provide blind-matable connection of the connector parts to establish electrical connection therebetween when the drawer is inserted in the cavity, the alignment system comprising:

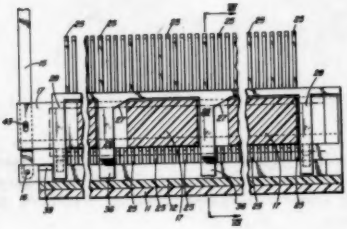
a pair of mounting means, for respectively mounting each of the connector parts to the cabinet and the drawer at locations that place the connector parts in interconnecting engagement when the drawer is inserted in the cavity, each mounting means having formed therein at least a pair of apertures, each connector part being mounted on the mounting means and accurately positioned with respect to the apertures formed in the respective mounting means;

alignment means respectively formed on the cabinet and the drawer, and being engageable with each other to align a portion of the cabinet to a portion of the drawer, the alignment means having extensions which are received by the apertures when the pair of mounting means are in place, thereby accurately positioning the connector parts with respect to their corresponding alignment means and with each other.

4,682,834
MULTIPLE CONTACT ZERO INSERTION FORCE CONNECTOR

Robert B. Dunn, Gloucester, and Bruce Wiltshire, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 7, 1985, Ser. No. 699,424
Int. Cl.⁴ H01R *13/62*
U.S. Cl. 439—267 **16 Claims**



1. A multiple contact connector comprising:
an elongate housing;
a plurality of cantilever spring contacts mounted in said housing, in at least one linear array;
an elongate actuating member mounted for reciprocal longitudinal movement in said elongate housing;
interengaging formations on said elongate housing and said elongate actuating member;
a deflectable locking member extending down from a top surface of said elongate housing adjacent to each end of the housing;
a laterally extending cam member on one side of each locking member;
an aperture adjacent each end of said actuating member, extending through said actuating member, said locking members extending through said apertures;
the arrangement such that on reciprocal longitudinal movement of said actuating member said interengaging formations move said actuating member also reciprocally in a diretion normal to said longitudinal movement, to move said spring contacts out of a contact position and return said spring contacts to a contact position, said actuating member also engaging with said cam member on each locking member to deflect said locking members laterally on movement of said spring contacts out of a contact position.

4,682,835
INSULATION DISPLACING TERMINAL WITH CANTILEVER SPRING CONTACT MEMBERS

Sharanjit S. Aujla, Kanata; George Debortoli, and Remo Contardo, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 721,259, Apr. 8, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,135
Int. Cl.⁴ H01R *11/20*
U.S. Cl. 439—395 **9 Claims**

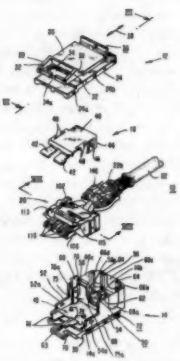
1. An insulation displacing terminal comprising:
a base;
two cantilever spring contact members having a relatively wide transverse width and a relatively narrow thickness and extending up from said base, the contact members having top edges and opposed inner edges between which a conductor is pushed, the intersections of said top edges and said opposed inner edges defining insulation slicing edges;
each contact member having a lower portion and an upper portion, the lower portions having upwardly and inwardly inclined outer edges and the upper portions having upwardly and outwardly inclined outer edges, the upper and lower portions congruent at a neck section;
a slot extending between the inner edges of the lower portions and a swage on one of said contact members on the inner edge thereof, the swage positioned immediately above said slot and spacing said inner edges of said upper portions slight apart;

said upper portions defining a conductor receiving part; and
said upper portions being of a reduced cross-sectional thickness relative to the thickness of said lower portions for at least a major part of the distance from said top edges toward said neck section.

4,682,836
ELECTRICAL CONNECTOR AND CABLE TERMINATION APPARATUS THEREFOR

Peter Noorily, Bridgewater, and Joseph P. Slachetka, Ringoes; both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Oct. 7, 1985, Ser. No. 785,312
Int. Cl.⁴ H01R *4/24*
U.S. Cl. 439—426 **19 Claims**



1. A shielded electrical connector, comprising:
an electrically insulative housing;
an electrically conductive shield supported by said housing; and
a cable termination sub-assembly for electrically terminating insulated conductors of an electrical cable exteriorly of said housing and for subsequent attachment to said housing, comprising:
(a) an electrically insulative contact holder, said holder insulatively supporting a plurality of electrical contacts each having an insulation displacement portion and a terminal portion;
(b) an electrically insulative conductor holding block, said block including a plurality of conductor retention means for receiving and holding said cable conductors

therein, said block further supporting insulatively a pair of electrically conductive shorting elements, each element including a pair of spaced, exposed terminals, said conductor retention means in said block adapted to dispose conductors therein individually into electrical engagement with said insulation displacement portions of said contacts upon joining said contact holder and said block, each terminal on each shorting element being disposed to contact a terminal portion of a different, unique electrical contact to thereby commonly electrically connect two different pairs of electrical contacts; and

(c) means for cooperatively maintaining said holder and said block in joined relation.

4,682,837

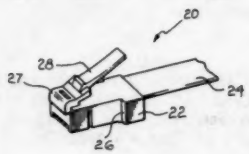
EIGHT CONDUCTOR MODULAR PLUG

Stephen M. Thomas, Torrington, and Ronald Nitowski, Naugatuck, both of Conn., assignors to The Siemon Company, Watertown, Conn.

Continuation of Ser. No. 634,818, Jul. 26, 1984, abandoned. This application Nov. 20, 1985, Ser. No. 799,781

Int. Cl.[4] H01R *13/639*

U.S. Cl. 439—344 **2 Claims**



1. In an eight position modular plug for telephonic and related equipment including an insulating housing having eight contacts therein, each contact being connected to a wire, each of said contacts and wires being substantially mutually parallel to each other throughout the insulating housing, the housing having a front face, the front face including a plurality of apertures to permit access between the eight contacts and a modular jack, the housing having an upper surface with a locking means thereon which is associated with the front face, the housing having a rear face with a unitary insulating lead extending therefrom, the unitary lead surrounding the eight wires, the improvement comprising:

means for allowing insertion of said front face of said housing into either a six or eight position modular jack, said means for allowing insertion comprising a pair of oppositely disposed stepped-in portions extending from said front face along the sides of said housing wherein at least a portion of said housing is capable of insertion into a six or eight position modular jack.

4,682,838

MULTIPOLAR PLUG

Klaus-Peter Achtnig; Herrman Herfort, and Gunther Hegner, all of Berlin, Fed. Rep. of Germany, assignors to KRONE GmbH, Berlin, Fed. Rep. of Germany

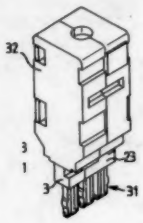
Filed Dec. 5, 1985, Ser. No. 805,450

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446622

Int. Cl.[4] H01R *9/00*

U.S. Cl. 439—598 **8 Claims**

1. A plug comprising a housing; a one-piece synthetic plastic insert including a retaining section captured in said housing and a second section having a first part which is confined in said housing and a second part which is located outside said housing, said second section having first and second sides; and at least one electric sheet metal elongated contact member at each side of said second section, each of said contact members having a first portion located on said first part and confined in said retaining section, said contact members further having second and third longitudinally extending marginal portions respectively anchored in the first and second parts of the second section and being partially embedded in the respective



sides of said second section, with the retaining section disposed between the second and third portions of the contact members and with said second portions being confined on said first part in said housing.

4,682,839

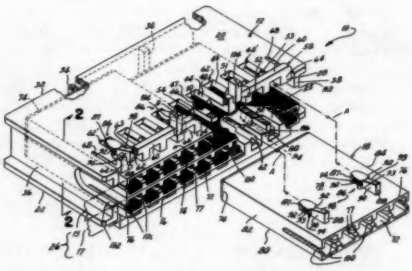
MULTI-ROW MODULAR ELECTRICAL CONNECTOR

J. Robert Bryce, Fairport, N.Y., assignor to Crane Electronics, Inc., Cincinnati, Ohio

Filed Jan. 30, 1986, Ser. No. 824,156

Int. Cl.[4] H01R *13/506*

U.S. Cl. 439—598 **42 Claims**



1. A modular electrical connector comprising:

a cell having an upper wall and a lower wall defining a receiving area between planar and parallel respective inner surfaces of the upper and lower walls;

a plurality of modules each adapted to carry electrical contacts between planar and parallel first and second module walls, each said module receivable in the receiving area and positionable such that when received in the receiving area, each said first module wall is adjacent a cell wall inner surface and each said second module wall is spaced from both said cell walls;

securement means on the cell walls and each said first module wall for cooperatively, tridimensionally securing each said module to the cell and to a said adjacent cell wall inner surface when the module is received in the receiving area, said securing of each said module being independent of whether any other said module is secured to the cell.

4,682,840

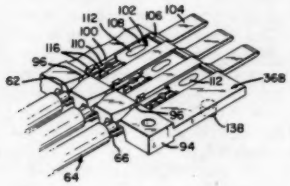
ELECTRICAL CONNECTION AND METHOD OF MAKING SAME

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 769,552, Aug. 26, 1985, Pat. No. 4,602,831, which is a continuation of Ser. No. 536,017, Sep. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 442,472, Nov. 17, 1982, abandoned, which is a continuation of Ser. No. 670,662, Nov. 13, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 852,672

Int. Cl.[4] H01R *4/02, 11/28*

U.S. Cl. 439—874 **8 Claims**



1. An electrical connection comprising an electrical contact member and at least one electrical conductor connected thereto by a joint, said contact member having at least a contact section and a conductor-connecting section, said conductor-connecting section having at least one longitudinal slot along which a respective said conductor is disposed, said at least one slot having continuously along a substantial length thereof a width slightly less than the diameter of said conductor whereby a said conductor is disposed therealong in a force-fit therewithin, whereafter said conductor is welded to said contact member to form a weld joint constituting the termination.

4,682,841

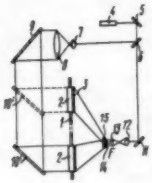
LIGHT RADIATION CONCENTRATOR AND METHOD OF MAKING THE SAME

Viktor V. Afian, ulitsa Sevaka, 2, kv. 13; Albert V. Vartanian, ulitsa Aigestana, 2, kv. 57; Ruben G. Martirosian, ulitsa Shinararneri, 27, kv. 32, all of Erevan; Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17, and Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64, both of Moscow, all of U.S.S.R.

Filed Jun. 15, 1981, Ser. No. 273,389

Int. Cl.[4] G02B *5/32;* G03H *1/02;* F24J *2/02*

U.S. Cl. 350—3.7 **5 Claims**



1. A method of making a light radiation concentrator consisting of a frame and at least two radiation concentrating facets secured in said frame and comprising holograms, the diffraction gratings of said holograms having a structure enabling the provision of a common focal spot, for a given wavelength of light incident thereon, for all said concentrating facets, comprising the following steps: using recording objects in a number corresponding to the number of said radiation concentrating facets; rigidly securing said recording objects in said frame of the concentrator; recording and developing in a sequence on each of said recording objects an interference pattern produced by a collimated reference beam and an object beam of coherent radiation diverging from said common focal area; causing said reference beam to move transversely while remaining parallel to its original direction between said recordings of the interference pattern and directing said object beam from the common focal spot to said respective recording object; causing said object beam to pass through a diffusing screen placed in the focal plane of the concentrator and causing it to pass after the passage through said diffusing screen through a diaphragm, the shape of the aperture of the diaphragm corresponding to any predetermined shape of said focal spot.

4,682,842

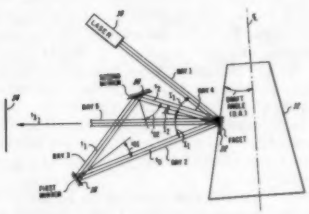
SCANNING SYSTEM WITH TWO REFLECTIONS FROM SCANNING SURFACE BY MIRRORS WITH OPTICAL POWER

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 31, 1984, Ser. No. 646,324

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.7 **2 Claims**



1. A scanning system including a rotatable mirror assembly with multiple reflective surfaces, said surfaces having a predetermined draft angle with the axis of rotation of said assembly, first means for introducing a beam of light toward said multi-surfaced mirror assembly, said light being reflected in turn by each active surface of said mirror assembly, a first mirror having an aspheric surface placed in the path of light reflected from the active surface of said multi-surfaced mirror assembly, said first mirror having a geometric focus at the active surface of said mirror assembly, a second mirror having an aspheric surface placed in the path of the reflected light from said first mirror, said second mirror reflecting said light back to the active surface of said multi-surfaced mirror assembly for reflection toward a surface to be scanned, the scanning light beam having no wobble effects and reduced bow effects, and being focussed at said surface to be scanned, wherein the curvatures of said first and second aspheric surface mirrors are determined according to the following relationships, respectively:

$$C_1 = -\frac{t_2 \cos i_1}{2t_1 t_3},$$

$$C_2 = \frac{(t_1 + t_2)\cos i_2}{2t_1(t_2 + t_3)},$$

where t_1 is the distance between said first and second aspheric surface mirrors, t_2 is the distance between said second aspheric surface mirror and said active facet of said mirror assembly, t_3 is the distance from said active facet to said surface to be scanned, and angles i_1 and i_2 being the angles of incidence of said light beam at said first and second aspheric surface mirrors, respectively.

4,682,843

OPTICAL WAVEGUIDE JUNCTION AND METHOD OF MAKING SAID JUNCTION

Hans F. Mahlein, Unterhaching; Herbert Michel, Munich; Achim Reichelt, Unterhaching, and Gerhard Winzer, Putzbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,911

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310587

Int. Cl.[4] G02B 6/26, 6/42

U.S. Cl. 350—96.15 5 Claims

1. In a optical waveguide junction for an optical transmission line having a lead-in and a lead-out aligned fiber pair with a partially pervious layer arranged between the lead-in and lead-out aligned fibers and diagonally to their axis and a fiber branching off laterally from the lead-in and lead-out aligned fibers at the level of the partially pervious layer, wherein

the lead-in and an optical transmission line fiber are monomode fibers, the core diameter of the transmission line fiber being no larger than the core diameter of the lead-in fiber, while the lead-out fiber, which continues from the partially pervious layer and also the branching fiber are multimode fibers and, further, the core diameter o f the lead-out aligned fiber, which continues from the partially pervious layer, is larger than the core diameter of the lead-in aligned fiber feeding the partially pervious layer, and wherein

the junction operates as a wave-length demultiplexer which is located at the output end of the optical-fiber transmission line for unidirectional multi-channel transmission for demultiplexing operations, with the branching fiber of the demultiplexer being fed from the frequency-selective partially pervious layer, the lead-in aligned fiber being integral with or coupled to a fiber of the transmission line, which transmission line fiber has a core diameter no larger than that of the branching fiber of the demultiplexer.

4,682,844

DEVICE FOR DIVERTING THE DIRECTION OF LIGHT TRAVELLING THROUGH AN OPTICAL CONDUCTOR

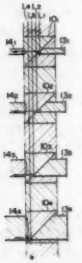
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,548

Claims priority, application Japan, Sep. 26, 1983, 58-178928

Int. Cl.[4] G02B 6/26

U.S. Cl. 350—96.15 8 Claims



7. A light diverting and switching device connected in cascade between one transparent cylindrical optical conductor at a light source side and another transparent cylindrical optical conductor at a light emission side comprising a plurality of light diverting and switching portions connected in series between said one and another optical conductors for diverting and picking up a part of light transmitted through said optical conductors, wherein each of said light diverting and switching portions comprises a first transparent cylindrical member having one surface formed on a horizontal plane at the light source side and another surface formed on a plane inclined with respect to said horizontal plane, a second transparent cylindrical member having one surface formed on said inclined plane connected with the inclined another surface of said first cylindrical member and another surface formed on a horizontal plane at the light emission side, the second transparent cylindrical member being further provided with a circular hole elongated in a horizontal direction toward said inclined surfaces, a third transparent cylindrical member for diverting light installed to move back and forth in said circular hole of said second cylindrical member and having an edge surface formed on an inclined plane parallel to the inclined one surface of said second cylindrical member, and a fourth transparent cylindrical member connected with said first cylindrical member and having a connecting surface disposed at a position to receive reflected light from said another inclined surface of said first transparent cylindrical member such that said fourth transparent cylindrical member thereby receives said diverted light, each third cylindrical member having a cross-sectional area, the cross-sectional area of each third cylindrical member being greater than the cross-sectional area of an immediately prior third cylindrical member with respect to the direction of light propagation from the light source side to the light emission side.

4,682,845

APPARATUS FOR TRANSMITTING OPTICAL IMAGE

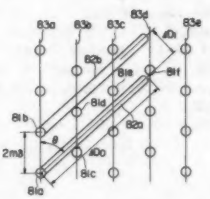
Yoshitoshi Itoh, Ome; Katsuhiro Mizuno, Tokyo, and Atomi Noguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 28, 1984, Ser. No. 625,593

Claims priority, application Japan, Jun. 30, 1983, 58-116978; Sep. 1, 1983, 58-158950

Int. Cl.[4] G02B 6/32

U.S. Cl. 350—96.18 5 Claims



1. An apparatus for transmitting an optical image comprising:

an image guide means which is formed by bundling optical fibers and transmits lights;

an objective lens system, arranged on the side of an edge surface of said image guide means, for forming an image of an object which is observed onto said edge surface of said image guide means;

first dispersive device means which cooperates with said objective lens system and disperses a location of the image formed on said image guide edge surface in accordance with wavelengths of lights, said first dispersive device means being arranged by being rotated by a constant angle with respect to the edge surface of said image guide means around an optical axis of said objective lens system as a center in the manner such that images at end surfaces of the respective optical fibers which form said image guide means do not overlap mutually, said images being able to

be formed on the surface of the object observed through said objective lens system;

an ocular lens system, arranged on the side of a rear edge surface of said image guide means, for projecting the lights which are transmitted onto said rear edge surface through said image guide means onto a screen; and

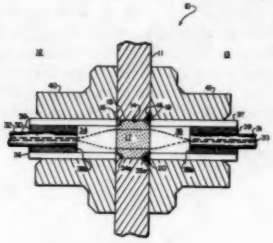
second dispersive device means which are transmitted through said image guide means onto the rear edge surface thereof in accordance with wavelengths, thereby synthesizing the image on the screen, said second dispersive device means being arranged by being rotated by a constant angle in the same direction as said first dispersive device means with regard to the rear edge surface of said image guide means around an optical axis of said ocular lens system as a center.

4,682,846

HERMETIC HIGH PRESSURE FIBER OPTIC BULKHEAD PENETRATOR

Steven J. Cowen, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1981, Ser. No. 322,808
Int. Cl.⁴ G02B *6/32*
U.S. Cl. 350—96.18 **8 Claims**



1. An apparatus assuring the transmission of optical data through a wall separating a first optical fiber disposed in a first medium from a second optical fiber disposed in a higher pressure second medium comprising:

a bore provided in the wall being shaped with an annular cut at one end and having a rim extending therein at its opposite end;

an essentially cylindrically-shaped glass plug sized to fit in the bore and configured with a ring-shaped recess on one end to rest on the rim and further configured with an annular recess on its opposite end for providing an optically transparent window;

means disposed between the cylindrically-shaped glass plug in its annular recess and in the annular cut in the one end of the bore for hermetically sealing the first medium from the second medium;

a first one-quarter pitch graded refractive index rod lens disposed between the end of the first optical fiber and the cylindrically-shaped glass plug for collimating optical data therethrough; and

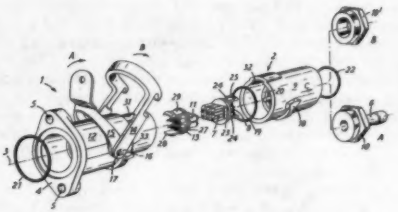
a second one-quarter pitch graded refractive index rod lens disposed between the end of the second optical fiber and the cylindrically-shaped glass plug and being aligned with the first one-quarter pitch graded refractive index rod lens, for collimating optical data therethrough.

4,682,847

CONNECTOR FOR RELEASABLE CONNECTION OF A FIRST AND A SECOND APPARATUS

Robert H. Moore, Mickleover, and Paul Morgan, Duffield, both of United Kingdom, assignors to John Davis & Son (Derby) Limited, Derby, United Kingdom

Filed Nov. 7, 1984, Ser. No. 669,239
Claims priority, application United Kingdom, Nov. 8, 1983, 8329734
Int. Cl.⁴ G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **8 Claims**



1. A connector for releasably connecting a first apparatus to a second apparatus, the connector comprising:

first and second parts, said parts being arranged for slidable interengagement along a common axis,

separate resilient means located between the first and second parts acting in a sense to urge the parts apart,

engagement means on the second part,

a handle pivotally supported on the first part for pivotal movement about a second axis extending generally perpendicular to the common axis,

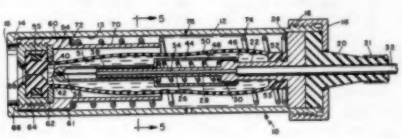
a stirrup member pivotally supported on the handle for pivotal movement about a third axis lying spaced from but extending generally parallel to the second axis, said stirrup means being arranged to engage the engagement means with the handle in an open state, the third axis lying to one side of a plane extending parallel to the first axis and containing the second axis, while with the handle in a closed state the third axis lies to the other side of the said plane, thereby causing progressive pivotal movement of the handle from the open to the closed state in a first sense about the second bar axis initially drawing said two parts together and then allowing limited movement of said parts apart under the force of the resilient means so that said resilient means will urge said handle in said first sense.

4,682,848

UNDERWATER-MATEABLE OPTICAL FIBER CONNECTOR

James L. Cairns, Mims, and Dennis K. Ferbas, Titusville, both of Fla., assignors to Lockheed Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 657,223, Oct. 3, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 789,445
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **48 Claims**



1. An underwater mateable fiber optic connector, comprising:

a first unit with a hollow casing for receiving the end of a first optical fiber and including:

support means in said casing for supporting said first optical fiber end;

hollow probe means movable in said casing for being moved to a retracted position with respect to said support means exposing said first optical fiber end or to an extended position with respect to said support means sheathing said first optical fiber end; and

a first interior chamber within said casing for containing said probe means and having a first fluidresistant seal movable in said casing and penetrable by said probe means for being moved to an extended position away from said probe means and a retracted position penetrated by and exposing said probe means; and

a second unit with a body for receiving the end of a second optical fiber and for fitting to said first unit casing when said units are joined, and including:

first stop means in said body for moving said first seal to its retracted position when said units are joined;

a second interior chamber in said body with a second fluid-resistant seal penetrable by said probe means when said units are joined and said first seal is in its retracted position;

second stop means in said second chamber for, when said units are joined and said probe has penetrated said first and second seals, moving said probe means to its retracted position; and

an alignment means in said second chamber for, when said units are joined, holding said second optical fiber end and for receiving from said support means said first optical fiber end in optical alignment with said second optical fiber end.

4,682,849

OPTICAL FIBER JUNCTION AND METHOD OF MAKING SAME

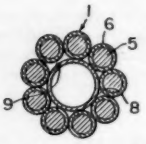
Nobuo Kowata, and Naoshige Sasano, both of Sagamihara, Japan, assignors to Showa Electric Wire & Cable Co. Ltd.

Continuation of Ser. No. 663,597, Dec. 3, 1984, abandoned, which is a division of Ser. No. 416,585, Sep. 10, 1982, Pat. No. 4,497,643. This application Feb. 19, 1986, Ser. No. 831,079

Claims priority, application Japan, Sep. 16, 1981, 56-145776

Int. Cl.[4] G02B *6/40;* **C03B** *23/20*

U.S. Cl. 350—96.22 **3 Claims**



1. A method of making an optical fiber junction device in which light is equally distributed through a plurality of optical fibers, comprising the steps of:

providing a central inner pipe or rod of glass with an axial tapered portion having a reduced diameter;

arranging a plurality of optical fibers around an outer periphery of said inner pipe or rod, said plurality of optical fibers being spaced from said outer periphery of said inner pipe or rod at said axial tapered portion;

fixing said plurality of optical fibers in position around said outer periphery of said inner pipe or rod;

externally heating said optical fibers and said central inner pipe or rod so as to cause said plurality of optical fibers to deform into conformity with said axial-tapered portion of said central pipe or rod of glass to form a thermally fused assembly having radially arranged cores of sectorial cross section;

elongating said thermally fused assembly by stretching said assembly in opposite directions; and

cutting said assembly at a location which has an outside diameter of a single optical fiber and splicing said single optical fiber to said assembly.

2. An optical fiber junction device fabricated by the steps of claim 1.

4,682,850

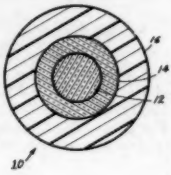
OPTICAL FIBER WITH SINGLE ULTRAVIOLET CURED COATING

John S. White, Roanoke; A. Dahlgren Vaughan, Salem, and Francis I. Akers, Roanoke, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,080

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **11 Claims**



1. An optical fiber comprising a core and a cladding formed of similar materials, the core having a higher index of refraction than the cladding, and a single layer of ultraviolet cured resin having a thickness of at least 50 microns around said cladding, said single layer of ultraviolet cured resin exhibiting a tensile modulus in the range of about 1,000 psi to 10,000 psi, said fiber having attenuation losses of less than about 0.5 decibels/kilometer at room temperature and at −40° C. Celsius when transmitting light at about 1,300 or about 1,550 nanometers and otherwise being buffered by said single layer in a manner similar to a double coated optical fiber.

4,682,851

SOFT AND TOUGH RADIATION-CURABLE COATINGS FOR FIBER OPTIC APPLICATION

Robert E. Ansel, Hoffman Estates, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 170,148, Jul. 18, 1980. This application Feb. 23, 1984, Ser. No. 582,705

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.34 **4 Claims**

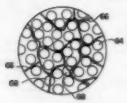
1. Optical glass fiber coated with a radiation-cured film of a radiation-curable liquid coating composition which cures to form a soft and tough coating, said radiation-curable liquid coating composition comprising, a polyurethane, polyamide or polyurea oligomer having (1) a molecular weight in the range of about 2000 to about 8000; (2) amide, urea or urethane groups in an amount of one such group for every 300 to 900 units of weight, and (3) polyalkylene polyether, polyalkylene polysulfide or polyalkylene polyester groups in which the alkylene moiety contains from 2–6 carbon atoms, said polyether, polysulfide or polyester constituting from about 40% to about 90% by weight of said oligomer, each end of said oligomer being terminated with a monoethylenically unsaturated addition polymerizable group, from 20% to 50%, based on the total weight of the composition, of a radiation-curable monoethylenically unsaturatead monomer having a T_g below about 10° C., and from about 2% to about 20%, based on the total weight of the composition, of a monoethylenically unsaturated monomer having a strong capacity for hydrogen bonding.

4,682,852

REFLECTIVE SHEETING TECHNOLOGY

Victor Weber, 2701 N. Margaret St., North St. Paul, Minn. 55109

Filed Jul. 23, 1984, Ser. No. 633,409
Int. Cl.[4] G02B 5/12
U.S. Cl. 350—105 12 Claims



1. A reflex light reflector comprising a laminate of water-insoluble layers including an internal specular-reflecting metal layer sealed between water-insoluble layers and formed in situ by vapor deposition of metal to a sufficient thickness to constitute a continuous opaque electrically conductive film, and a monolayer of microsphere lens elements of a diameter within the range of 10 to 200 microns overlying the metal layer and bonded by resinous bonding material in optical relationship thereto for reflex light reflection, wherein

said metal layer is characterized by being multiply fractured in a random pattern of crack lines resembling the cracking pattern of a dried mud flat such that it consists of a multiplicity of non-overlapping patches of metal with adjacent patches having a crack line therebetween, each fractionally separated from others sufficiently to obstruct electrical conductivity between patches and thereby render said metal layer highly resistant to electrolytic corrosion, said crack lines of said metal layer being not so frequent as to form a discrete patch of metal under each said lens element, said patches of metal being of varied area size with each patch having an area size sufficient to underlie at least one up to about thirty of said lens elements, each said patch not exceeding 1000 microns in its longest dimension, with each said patch having at least one depression therein and each said depression being optically associated with a said lens element in a manner such that each lens element overlies a said depression, said laminate being further characterized by having over 80% of said lens elements thereof overlying patches having at least two and no more than twenty said lens elements optically entirely within the perimeter edges of individual said patches of metal.

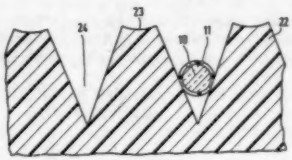
4,682,853

TRANSMISSION PROJECTION SCREEN AND METHOD OF MANUFACTURING SAME

Dirk J. Broer; Renso J. M. Zwiers, and Cornelis M. G. Jochem, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1986, Ser. No. 844,051
Claims priority, application Netherlands, Jan. 10, 1986, 8600043
Int. Cl.[4] G03B 21/60
U.S. Cl. 350—128 14 Claims

1. A transmission projection screen comprising a transparent substrate having a front surface which is provided with mutually parallel ribs from which light issues during operation of the screen, grooves being present between the successive ribs, in which grooves light-absorbing thread-like elements are



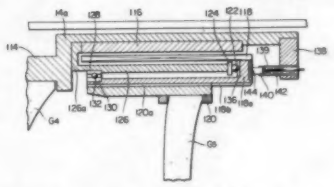
disposed, characterized in that the light-absorbing elements are made from glass fibres.

4,682,854

LENS BARREL INCORPORATING A MOTOR

Ryoichi Hanamori, and Hiroshi Yamamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1985, Ser. No. 688,365
Claims priority, application Japan, Jan. 10, 1984, 59-2429; Jan. 10, 1984, 59-1577[U]; Jan. 11, 1984, 59-2198[U]; Jan. 11, 1984, 59-2199[U]
Int. Cl.[4] G02B 7/04
U.S. Cl. 350—255 5 Claims



1. A lens barrel incorporating a motor, comprising:

a fixed tube member;

a hollow cylindrical coil member arranged within said fixed tube member, said coil member being rotatable around an optical axis;

a fixed hollow permanent magnet and a fixed hollow yoke member respectively arranged on opposite sides of said coil member;

a commutator arranged on an end surface of said cylindrical coil member, said commutator rotating in conjunction with the rotation of said coil member;

a brush assembly arranged at a position opposing said commutator, said brush assembly in electrical contact with said commutator and being adapted to supply energy to said coil member;

a first movable member secured to said coil member, said first movable member having a first helicoid formed thereon, and being adapted to rotate in conjunction with the rotation of said coil member;

a second movable member having a second helicoid thereon for engaging said first helicoid, said second movable member being adapted to move parallel with the optical axis as by the lens barrel in response to the rotation of said first movable member; and

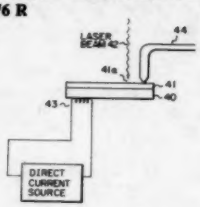
a lens construction secured to said second movable member so as to move in conjunction with the movement of said second movable member.

4,682,855

LASER-LIGHT ABSORBER AND METHOD FOR ABSORBING LASER LIGHT

Tatsutoku Honda; Michiyuki Endo, both of Ibaraki; Saburo Wakamatsu, Tokyo, and Yoshio Kudo, Saitama, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology and Showa Denko Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,221
Int. Cl.[4] G02B *5/00, 27/00*
U.S. Cl. 350—276 R **12 Claims**



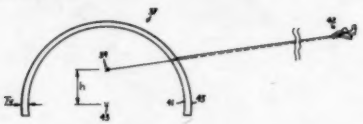
1. A laser-light absorber comprising a metal body and a flame-sprayed film essentially consisting of a ceramic metal oxide applied on said metal body, whereby laser-light is absorbed by said absorber to an extent of at least about 90%.

4,682,856

CONTOURED TRANSPARENCY PROVIDING REDUCED OPTICAL DISTORTION AND METHOD FOR MAKING IT

David W. Holdridge, Fullerton, Calif., assignor to Swedlow, Inc., Garden Grove, Calif.

Filed Sep. 4, 1984, Ser. No. 646,930
Int. Cl.[4] G02B *5/00;* **G02C** *7/02*
U.S. Cl. 350—319 **22 Claims**



1. A contoured transparency providing low optical distortion of light passing through any portion of it and received at an adjacent, fixed low distortion location, the transparency comprising a sheet of transparent material formed to have a selected contour with a concave side and a convex side each portion of the sheet having a single degree of curvature corresponding substantially to the shape of a cylinder or cone, wherein the sheet has two orthogonal axes across its surface and a thickness that varies along both such axes in a prescribed fashion, such that light passing obliquely through any portion of the sheet at non-perpendicular horizontal and vertical impingement angles and received at a particular fixed low distortion location in the space adjacent to the sheet's concave side is substantially undistorted.

4,682,857

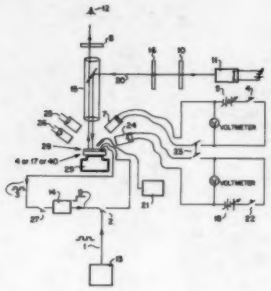
LIQUID CRYSTAL HOT SPOT DETECTION WITH INFINITESIMAL TEMPERATURE CONTROL

Peng Tan, 20674 Acadia Ct., Cupertino, Calif. 95014

Filed Apr. 2, 1985, Ser. No. 718,866
Int. Cl.[4] G01R *31/22*
U.S. Cl. 350—331 T **11 Claims**

11. A new use of liquid crystal for detecting hot spot on die or wafer with a hot spot detection method, said liquid crystal comprises:

4 CYANO-4'HEXYL-BIPHENYL, trade name is K-18 nematic liquid crystal, or
4 CYANO-4'PENTYL-BIPHENYL, trade name is K-15 nematic liquid crystal; or
4 CYANO-4'HEPTYL-BIPHENYL, trade name is K-21 nematic liquid crystal; or
4 CYANO-4'OCTYL-BIPHENYL, trade name is K-24 nematic liquid crystal; or



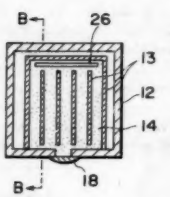
4 CYANO-4'NONYL-BIPHENYL, trade name is K-27 nematic liquid crystal; or
4 CYANO-4'DECYL-BIPHENYL, trade name is K-30 nematic liquid crystal; or
4 CYANO-4'UNDERDECYL-BIPHENYL, trade name is K-33 nematic liquid crystal; or
4 CYANO-4'DODECYL-BIPHENYL, trade name is K-36 nematic liquid crystal.

4,682,858

LIQUID CRYSTAL DEVICE HAVING REDUCED-PRESSURE REGION IN COMMUNICATION WITH FERROELECTRIC LIQUID CRYSTAL

Junichiro Kanbe, Yokohama; Shinjiro Okada, Kanagawa; Tohru Takahashi, Tokyo, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,712
Claims priority, application Japan, Aug. 20, 1984, 59-171529; Dec. 7, 1984, 59-258566; Dec. 13, 1984, 59-263663
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—334 **42 Claims**



1. A liquid crystal cell comprising a pair of substrates disposed with a gap therebetween; a liquid crystal injection port; a liquid crystal injected through the liquid crystal injection port and enclosed in the gap between the substrates to form a liquid crystal layer region; spacer members disposed on at least one of the substrates to regulate the thickness of the liquid crystal layer region; and a reduced pressure space in communication with said liquid crystal layer region.

18. A liquid crystal cell comprising: a cell structure comprising a pair of substrates disposed with a gap therebetween, a plurality of spacer members disposed between the substrates to

maintain the gap, and a ferroelectric liquid crystal enclosed in the cell structure; at least one of the substrates being flexible and said spacer members being disposed with a spacing a (mm) from each other satisfying the relationship

$$\frac{a^4}{Et^3} > 0.32$$

wherein E denotes the modulus of elasticity (Kg.f/mm^2) of the flexible substrate and t denotes the thickness (mm) of the flexible substrate.

33. A liquid crystal device comprising:

a non-flexible first substrate provided with a first group of electrodes, a first driving circuit connected to said first group of electrodes and a second driving circuit,

a flexible second substrate provided with a second group of electrodes, and

a ferroelectric liquid crystal disposed between the first and second substrates; said second electrode group connected to said second driving circuit, said first and second driving circuits being respectively connected to an external controlling circuit.

4,682,859

OBJECTIVE LENS FOR MICROSCOPE

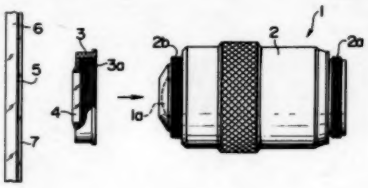
Takayosi Togino, Tokyo; Yuko Kobayashi, and Ken Yonekubo, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 4, 1985, Ser. No. 707,603

Claims priority, application Japan, Jul. 5, 1984, 59-100683[U]

Int. Cl.^{4} G02B *2/02*

U.S. Cl. 350—414 **11 Claims**



1. A microscope lens system for viewing an object which may be covered by a transparent cover glass, comprising:

a lens barrel having an objective lens therein;

at least one transparent planar parallel plate having a predetermined optical path length;

said objective lens being designed for the combined optical path lengths of a respective one of said at least one parallel plate and any cover glass placed upon the object viewed by the lens system; and

mounting means for detachably mounting said respective parallel plate on said lens barrel, whereby said respective parallel plate may be conveniently replaced by another respective parallel plate of different optical path length than said predetermined optical path length to prevent an aberration in image in the objective lens which would result from the use of a cover glass on the object being viewed of different thickness than said cover glass used with said first-mentioned parallel plate.

4,682,860

ULTRASMALL SIZE ZOOM LENS

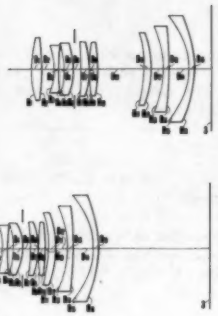
Kazuo Tanaka, Tokyo, and Akira Tajima, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 381,463, May 24, 1982, abandoned, and a continuation-in-part of Ser. No. 550,998, Nov. 10, 1983, abandoned, which is a continuation of Ser. No. 243,209, Mar. 12, 1981, abandoned. This application Feb. 7, 1985, Ser. No. 699,026

Claims priority, application Japan, Mar. 14, 1980, 55-32524; Jun. 4, 1981, 56-86188

Int. Cl.^{4} G02B *9/64, 15/14*

U.S. Cl. 350—423 **8 Claims**



1. A photographic zoom lens of ultrashort total length comprising:

a first lens group having a positive refractive power and positioned at the object side of the zoom lens;

a second lens group having a negative refractive power and positioned closer to the image side than the first lens group, said object side being the long conjugate and said image side being the short conjugate;

an air separation between said first lens group and said second lens group, said air separation being variable to effect zooming:

said first lens group having at least two positive lenses and at least one negative lens;

said second lens group having at least one positive lens and at least one negative lens; and

both said first lens group and said second lens group being arranged for moving toward the object side during zooming from the wide angle end to the telephoto end.

4,682,861

PROJECTION LENS

Jun Hosoya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,029

Claims priority, application Japan, Jun. 25, 1984, 59-130635; Jul. 27, 1984, 59-132297; Jul. 27, 1984, 59-132298

Int. Cl.^{4} G02B *9/34, 13/18*

U.S. Cl. 350—432 **6 Claims**

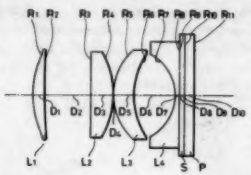
1. A projection lens for projecting an image onto a screen, comprising:

a first lens having a positive refracting power;

a second lens having a positive refracting power and a convex surface which is located at the side of said second lens nearer to the image and which has a larger curvature than that at the side of said second lens nearer to the screen; a third lens which consists of a meniscus lens having a concave surface located at the side of said third lens nearer to the image; and

a fourth lens having a concave surface which is located at the side of said fourth lens nearer to the screen and which has a larger curvature than that at the side of said fourth

lens nearer to the image, said first to fourth lenses being arranged, respectively, from a side of the screen in the order named, the combined refracting power of said second and third lenses being larger than the refracting



power of said first lens, at least one nonspherical surface being provided in said first lens, and at least one other nonspherical surface being provided in said second, third and fourth lenses.

4,682,862

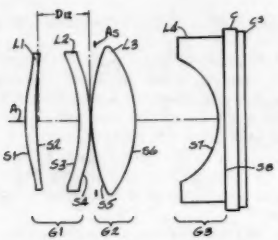
PROJECTION LENS

Jacob Moskovich, Cincinnati, Ohio, assignor to U.S. Precision Lens Incorporated, Cincinnati, Ohio

Continuation-in-part of Ser. No. 820,553, Jan. 17, 1986. This application Aug. 22, 1986, Ser. No. 899,477

Int. Cl.[4] G02B *13/18, 9/34, 9/60, 9/62*

U.S. Cl. 350—432 **42 Claims**



1. A projection lens for a cathode ray tube having a semi-field angle of essentially thirty degrees or greater which consists of a first lens unit of weak positive power, a second lens unit including a biconvex glass element, and a third lens unit having a strongly concave image side surface and which contributes to correction of field curvature, and a meniscus corrector lens element having at least one aspheric surface and positioned to said second lens unit less than 0.1 percent of the equivalent focal length of the lens and having a surface convex to said second lens unit and contributing to correction of oblique spherical aberration, said meniscus corrector lens element having an axial optical power

$$0.05 > K_M/K_0 > -0.23$$

where K_M is the optical power of said meniscus lens elements at the optical axis and K_0 is the optical power of the overall lens.

4,682,863

ULTRA-WIDE ANGLE MICROGRAPHIC LENS

John J. Simbal, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

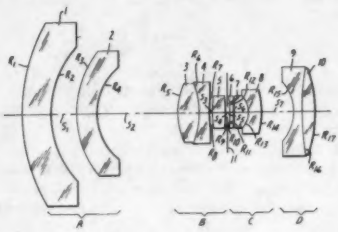
Filed Aug. 26, 1985, Ser. No. 769,441

Int. Cl.[4] G02B *9/64*

U.S. Cl. 350—463 **2 Claims**

1. An ultra-wide angle micrographic lens comprises ten lens elements comprising

four groups of lenses airspaced from one another, a first group comprising a pair of airspaced meniscus lens elements of converging power, a second group comprising a cemented doublet and a biconvex singlet, the third group comprising a plano-concave singlet and a cemented dou-



blet, and a fourth group comprising a cemented doublet, an aperture stop is located between the second and third groups, and said lens elements have a ratio of thickness to diameter equal to or exceeding ten percent.

4,682,864

METHOD AND APPARATUS FOR SIMULTANEOUSLY OBSERVING A TRANSPARENT OBJECT FROM TWO DIRECTIONS

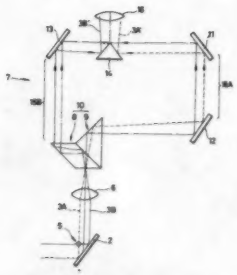
Toshiaki Kakii; Koichiro Matsuno, both of Kanagawa; Osamu Kawada, Ibaraki; Ryozo Ito, and Eiji Nakamura, both of Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Corporation and Nippon Kogaku K.K., both of Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,558

Claims priority, application Japan, Aug. 31, 1984, 59-180788

Int. Cl.[4] G02B *21/18*

U.S. Cl. 350—511 **17 Claims**



13. Apparatus for observing a transparent object from two directions comprising:

a light source for illuminating said object;

reflecting means for reflecting light from said source so that said light passes through said object in a first direction to form a first beam path containing a first image of said object and for reflecting light from said source having already passed through said object in a second direction to form a second beam path containing a second image of said object;

a single objective lens, said first and second beam paths passing through said single objective lens;

a first prism for reflecting said second beam path and transmitting said first beam path to cause said first and second beam paths to be separated;

means for combining said first and second beam paths so that

said first and second images form adjacent halves of a single field of vision; and

means, optically disposed between said prism and said combining means, for causing the length of said second beam path to be different from that of said first beam path to cause said first and second images to be formed at the same position.

4,682,865

CONCAVE MIRROR APPARATUS AND METHOD OF CONSTRUCTION

William E. Rogers, Haynersville, and David N. Borton, Troy, both of N.Y., assignors to Power Kinetics, Inc., Troy, N.Y.

Filed Jan. 31, 1986, Ser. No. 825,050
Int. Cl.[4] G02B 5/10, 7/18
U.S. Cl. 350—607 **31 Claims**

1. An apparatus comprising:

a mirror having first, second and third elongate strip portions in substantially parallel relationship to each other, and spaced from each other with said third elongate strip portion located between said first and second elongate strip portions; and

an apparatus for mounting said mirror comprising first and second members for supporting said mirror along said first and second elongate strip portions, respectively, said mounting apparatus including means, affixed to said third elongate strip portion, for applying force to said third elongate strip portion of said mirror to displace the portion of said mirror which is between said first and second strip portions relative to said first and second strip portions and thereby cause said mirror to curve about a first bending axis, said applying means comprising (1) a member having an elongate strip portion affixed to said third elongate strip portion of said mirror, and (2) means for bending said member to curve about a second bending axis orthogonal to said first bending axis, said bending means causing said mirror to curve about said second bending axis and thereby assume a concave shape.

4,682,866

HEAD-BORNE BINOCULAR INDIRECT OPHTHALMOSCOPE WITH INTEGRATED TELESCOPE

David Volk, 3336 Kersdale Rd., Pepper Pike, Ohio 44124

Filed Nov. 8, 1984, Ser. No. 669,345
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—205 **13 Claims**

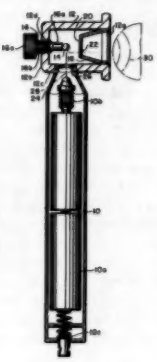
1. A head-borne binocular indirect ophthalmoscope containing a single centered light source slightly above the usually horizontal level of the bilateral symmetrical observing system of the ophthalmoscope, for directing a beam of light toward a hand-held indirect ophthalmoscopy lens, a low powered columnating lens located symmetrically in front of medial right and left oblique flat front surface mirrors which meet at an angle of 90° in a central usually vertical edge, each of said mirrors at an angle of 45° to the usually vertical center plane of symmetry of said ophthalmoscope, a pair of identical strong positive aspheric right and left telescope objective lenses with the front surface of each objective lens facing obliquely its respective medial oblique mirror, the optical axis of each of said objective lenses intersecting its respective medial oblique mirror at an angle of 45° with respect to a normal to the mirror, a second pair of lateral right and left flat oblique mirrors in oblique relation to the back surface of each objective lens, each of said lateral oblique mirrors at an angle of substantially 47° with respect to said center plane of symmetry of said ophthalmoscope the optical axes, and the axial chief rays along said optical axes, of said right and left objective lenses being coaxial and each intersecting its lateral oblique mirror at an angle of incidence of substantially 47° to then be reflected at an angle of reflection of substantially 47° so that each redirected optical axis of each objective lens is substantially 94° its original direction, to then become the optical axis and axial chief ray of each of the identical right and left ocular lenses of said telescopes, each lateral oblique mirror and its associated objective and ocular lenses forming a unit with the objective and ocular lenses fixed in coaxial position with respect to said mirror so that the optical axes of said objective and ocular lenses of said unit always intersect at a point on said lateral oblique mirror at an angle of substantially 94°, the secondary focus of each of said objective lenses coinciding with the primary focuses of its corresponding ocular lens.

4,682,867

APPARATUS FOR THE SELF-EXAMINATION OF THE HUMAN EYE

Herbert L. Gould, 90 Greenridge Ave., White Plains, N.Y. 10605

Filed Apr. 2, 1985, Ser. No. 718,873
Int. Cl.[4] A61B 3/02
U.S. Cl. 351—223 **13 Claims**



1. Apparatus for the self-examination of the human eye comprising:

(a) light source means for generating a beam of light along a given axis;

(b) an opaque disc with an off center pin hole having an axis orthogonal to said given axis of said light source means;

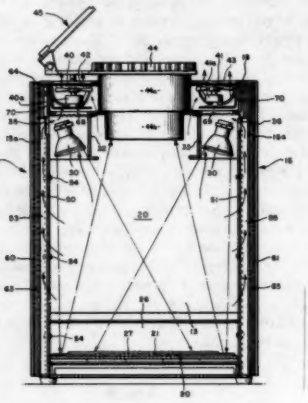
(c) sphere reflecting means positioned at the intersection of said orthogonal axes for orthogonally reflecting a beam of light from said light source means onto one side of said opaque disc and surrounding said off center pin hole; and

(d) support means for supporting said light source means, said opaque disc and said sphere reflecting means in said orthogonal axes relationship whereby a pin point of light is transmitted from said off center pin hole to a space on the other side of said opaque disc.

4,682,868
THERMAL MANAGEMENT SYSTEM FOR AN EPISCOPIC IMAGE PROJECTOR

Emile J. Constantin, Chicago, and Stephen Gryglas, Long Grove, both of Ill., assignors to Constantin Systems, Inc., Chicago, Ill.

Filed May 31, 1985, Ser. No. 739,828
Int. Cl.[4] G03B *21/06*
U.S. Cl. 353—58 **14 Claims**



1. In an opaque projector having a housing, an interior illumination chamber defined within the housing by a top, a base, and generally vertically extending sidewalls including a front wall, a back wall, and a pair of lateral sidewalls, a light source for illuminating an object placed within the illumination chamber, the light source generating heat and heated air within the illumination chamber when in use, the improvement in a thermal management system for the projector comprising:

lamps mounted adjacent the top of the projector, said lamps comprising said light source and being generally aimed toward the base, heat sink panels for absorbing heat generated by the light source within the illumination chamber, said heat sink panels mounted within the illumination chamber and in spaced relation to respective opposed sidewalls, each heat sink panel defining an air plenum between said heat sink panel and its respective sidewall, each said air plenum being open to said illumination chamber, said heat sink panels being respectively mounted in spaced relation to said front and back walls, said heat sink panels extending along substantially the entire inboard facing surface of said front and back walls, each said air plenum being open to said illumination chamber along at least one vertically extending side of a respective heat sink panel and

fan means for exhausting heated air from the illumination chamber, said fan means being mounted on the housing and drawing air through said air plenums to cool said heat sink panels.

4,682,869
IMAGE PROCESSING SYSTEM AND METHOD

Masaharu Itoh, Fujisawa; Taketoshi Yokemura, and Hiroshi Yanagisawa, both of Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

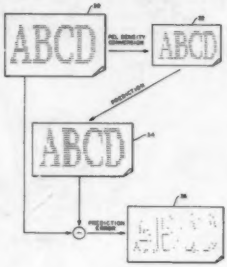
Filed Dec. 27, 1984, Ser. No. 686,578
Claims priority, application Japan, Dec. 28, 1983, 58-245622
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—260 **5 Claims**

1. A system for communicating an image between devices having resolutions which may vary, the system comprising:

means for receiving an input image from a first device having a first resolution level;

means for converting the input image into an image representing a lower level of resolution and a set of correction information representing a difference between the input image and a predicted image;

means for determining if the converted lower level of resolution is a fixed base level of resolution and for repeating the converting and determining steps if said lower level is not the fixed base level, said repeated conversion step using the image representing the lower level of resolution as the input image;



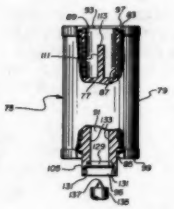
means for storing image data representing the base level and each set of correction information generated; and

means for regenerating an image at a second resolution for use in a second device having a second resolution which may differ from that of the first device including means for recalling the image data representing the base level and means for recalling a set of correction information, means for using the image data and the correction information to generate a higher level image and, if the higher level image is not equal to the second resolution, for repeating the use of image data and another set of correction data until the second resolution is reached.

4,682,870
APPARATUS FOR ENCODING A FILM CARTRIDGE USED IN A PARTICULAR TYPE CAMERA

William C. Atkinson, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 13, 1986, Ser. No. 817,960
Int. Cl.[4] G03B *17/26, 13/10*
U.S. Cl. 354—275 **18 Claims**



1. An improved combination of (a) a film cartridge of the type including a film spool having an elongate coaxial hole open at one end of said spool and (b) a photographic camera of the type having a shaft member receivable in said coaxial hole at the open end of said spool, wherein the improvement comprises:

said spool including a fracturable element located within said coaxial hole; and

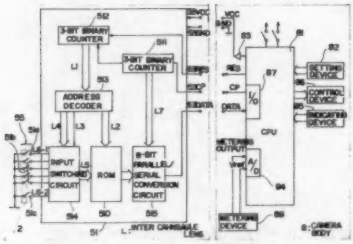
said shaft member including means for fracturing said fracturable element as the shaft member is received in said coaxial hole, whereby an indication will be provided that said cartridge was used in said camera.

4,682,871

APERTURE VALUE INFORMATION SWITCHABLE LENS BARREL

Tsuneyo Metabi, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1986, Ser. No. 902,886
Claims priority, application Japan, Sep. 2, 1985, 60-194154
Int. Cl.[4] G03B *7/091, 17/00*
U.S. Cl. 354—400 **24 Claims**



1. A lens barrel comprising;

information means for generating lens information, said information means including a first information unit for generating nominal aperture value information inherently stored therein, and a second information unit for generating effective aperture value information variable with image magnification,

information selecting means connected to said information means for selecting between said nominal aperture value information and said effective aperture value information, and

information transmitting means for transmitting information selected by said information selecting means outwardly of said lens barrel.

4,682,872

SIGNAL PROCESSING APPARATUS FOR A SEMICONDUCTOR POSITION SENSING DEVICE

Ryoichi Suzuki, Yokohama; Hideo Taka, Tokyo, and Shuichi Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,088
Claims priority, application Japan, Nov. 11, 1983, 58-211901
Int. Cl.[4] G03B *3/00;* **G01C** *3/10*
U.S. Cl. 354—403 **13 Claims**

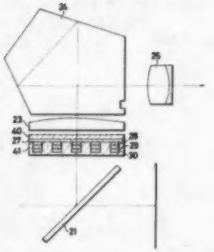
1. A signal processing apparatus for a semiconductor position sensing device having two output terminals, comprising:

(a) variable impedance means connected to at least one terminal of said output terminals;

(b) impedance varying means connected to said variable impedance means for varying an impedance of said variable impedance means;

(c) detecting means functionally connected to said two output terminals for producing a third output signal based on first and second output signals from said position sensing device; and

(d) output means connected to said detecting means for producing fourth output signal representing a position of an incident light to said position sensing device in accordance with the impedance of said variable impedance means when said third output signal represents that said first output signal and said second output signal are in a predetermined relationship as said impedance varying means varies the impedance of said variable impedance means.

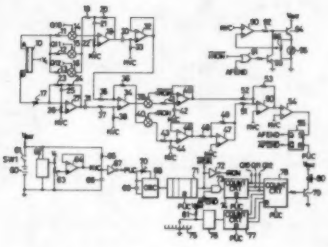


4,682,873

PHOTOMETRIC DEVICE FOR CAMERA

Hiroshi Ohmura, Saitama; Tokuichi Tsunekawa, Kanagawa; Shyuichi Kiyohara, Kanagawa, and Takashi Kawabata, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 770,162
Claims priority, application Japan, Aug. 31, 1984, 59-182155; Aug. 31, 1984, 59-182161; Aug. 31, 1984, 59-182162
Int. Cl.[4] G03B *7/099*
U.S. Cl. 354—478 **14 Claims**



1. A photometric device usable in a single lens reflex camera having a viewfinder system into which an object light from a photo-taking lens is introduced, comprising:

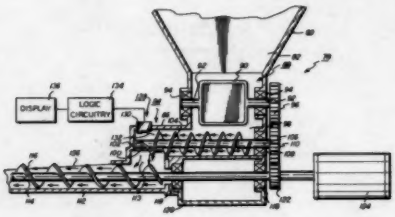
a photo-electric conversion element construction for measuring object light, said photo-electric conversion element construction comprising a transparent substrate and a photo-electric converter sandwiched between a transparent electrode and an opaque electrode laminated on the substrate, wherein said photo-electric conversion element construction is disposed in the optical path of said viewfinder system, and said transparent electrode, said photo-electric converter said opaque electrode and said transparent substrate are laminated in the recited order in the direction of incidence of the object light from said photo-taking lens.

4,682,874

PARTICLE LEVEL INDICATOR

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1981, Ser. No. 322,801
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD 13 Claims



1. An apparatus for indicating the depletion of particles being dispensed into a development system, including:

means for storing a supply of particles therein;

means for discharging particles into the development system;

means for transporting particles from said storing means to said discharging means; and

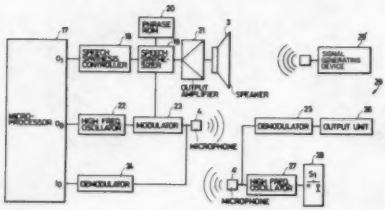
non-magnetic means, positioned in said transporting means for detecting the exhaustion of particles in said transporting means.

4,682,875

IMAGE FORMING SYSTEM HAVING EXTERNAL SIGNAL GENERATING MEANS

Tadashi Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,685
Claims priority, application Japan, Jul. 21, 1982, 57-125721; Jul. 21, 1982, 57-125722
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 4 Claims



1. An image forming system comprising:

an image forming apparatus;

a plurality of signal generating devices for generating respective inquire signals to said image forming apparatus, while said apparatus is supplied with power, wherein the respective inquire signals are for inquiring as to the states of said apparatus;

means for receiving the respective inquiry signals from each of said plurality of signal generating devices;

means for recognizing which one of said signal generating devices has generated a respective inquiry signal received by said receiving means; and

means for transmitting an answer signal, responsive to the respective inquiry signal received by said receiving means, to said one of said signal generating devices recognized by said recognizing means, the answer signal indicating the states of said apparatus,

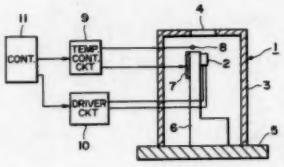
wherein each of said signal generating devices includes means for receiving an answer signal and means for informing an operator of the states of said apparatus in response to the answer signal.

4,682,876

INFORMATION RECORDING APPARATUS

Yasumasa Ohtsuka, and Masaharu Ohkubo, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,182
Claims priority, application Japan, Feb. 20, 1985, 60-031796
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 5 Claims



1. An information recording apparatus, comprising:

a semiconductor light source responsive to an information signal to be recorded to produce information light;

a photosensitive member for receiving the information light produced by said semiconductor light source;

means for supplying to said semiconductor light source an electric current I_0 having a current level lower than a light emitting threshold current Ith of said semiconductor light source before said semi-conductor light source is driven in accordance with the information signal to be recorded, so that said semi-conductor light source heats itself by the application of the current I_0.

4,682,877

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH A SELECTING MEANS OF MAGNIFICATION CHANGING ELEMENTS

Katsuyoshi Fujiwara, Osaka; Yoshihisa Miwa, Nara, and Shoichiro Yoshiura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1985, Ser. No. 768,705
Claims priority, application Japan, Aug. 31, 1984, 59-183256
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 1 Claim

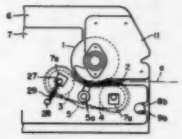
1. An electrophotographic copying apparatus comprising in combination an original document size detecting means for detecting size of an original document placed on an original document platform, a selecting means of various magnification changing elements which calculates and selects, on the basis of the size of said original document detected by said original document size detecting means and a predetermined size of copy paper or a predetermined magnification ratio, a proper magnification ratio when the size of said copy paper is predetermined, or a proper size of copy paper when the magnification ratio is predetermined, and an indicating means which indicates the necessity to change the direction of placement of said original document such that the magnification ratio is larger or the image forming area does not exceed the size of the copy paper in the case when either or both of said original document and/or copy paper are capable of being placed in such a manner that a longitudinal direction thereof is brought in either a crossing or parallel relation with respect to an exposure scanning direction.

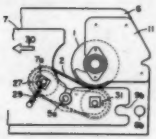
4,682,878

FIXING DEVICES FOR ELECTROPHOTOGRAPHIC APPARATUS

Tatsuji Takizawa; Nobutaka Noda, and Hideaki Takigawa, all of Tokyo, Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,428
Claims priority, application Japan, Apr. 30, 1985, 60-93232
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—3 FU 11 Claims





1. In a fixing device of the type comprising a fixing roller heated by heating means, and pressure applying means for fixing a toner image formed on a copying medium while the same is being clamped between said fixing roller and said pressure applying means to be conveyed in contact with said fixing roller, the improvement wherein:

said pressure applying means is mounted on a supporting member slidable with respect to a stationary member supporting said fixing roller, and said fixing device further comprising:

positioning means for setting said supporting member at a predetermined position with respect to said stationary member, and

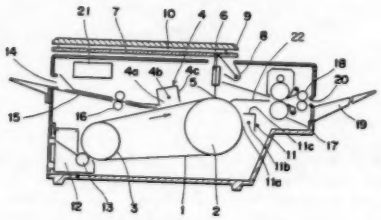
clamping means for clamping said supporting member at a predetermined position of said stationary member.

4,682,879

ELECTROPHOTOGRAPHIC COPIER

Itsurou Katoh, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1985, Ser. No. 759,734
Claims priority, application Japan, Jul. 31, 1984, 59-163224; Jul. 31, 1984, 59-163225
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 5 Claims



1. A electrophotographic copier for implementing an electrophotographic copying process, comprising in combination:

a photoconductor;

a charging means for uniformly charging said photoconductor and for transferring an image to be developed on said photoconductor to a copy paper;

an exposing means for exposing said charged photoconductor to an optical image at an exposure site of an exposure station to form a latent electrostatic image thereon, said exposing means being juxtapositioned to said charging means at a distance such that dark decay of said photoconductor before exposure is substantially eliminated;

a developing means which develops said latent image with toner particles;

an illuminating means positioned after said exposure means;

a fixing means which fixes said transferred toner particles in an imagewise manner to said copy paper;

a cleaning means which cleans said photoconductor,

a feeding means which carries said copy paper to said charging means during the image transfer phase of said copying process; and

a means for controlling the feeding means to transport a copy paper to the charging means synchronously with the movement of said photoconductor so as not to interfere with exposing of a complete optical image to said photoconductor by said exposing means said photoconductor, charging means, exposing means and fixing means being adjusted to said feeding means such that copy paper with the transferred image thereon passes said exposure station after completion of exposure of said optical image;

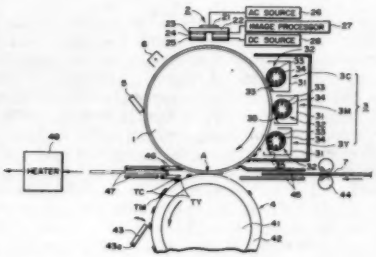
said copy paper following a path so as to be transported over said exposure site to said fixing means.

4,682,880

MULTICOLOR IMAGE RECORDING METHOD AND DEVICE UTILIZING A SINGLE IMAGE TRANSFER TO THE RECORDING MATERIAL

Haruo Fujii, Yokohama; Yutaka Inaba, Kawaguchi, and Yujiro Ando, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,490
Claims priority, application Japan, Sep. 13, 1984, 59-190537
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 9 Claims



1. An image recording method, comprising:

a first step of forming an electrostatic latent image on a rotatable latent image bearing member;

a second step of supplying a developer to the electrostatic latent image to form a visualized image on the latent image bearing member;

a third step of transferring by pressure the visualized image from the latent image bearing member to a rotatable visualized image bearing member press-contacted to the latent image bearing member, through a nip formed between the latent image bearing member and the visualized image bearing member, the visualized image bearing member having a surface roughness larger than that of the latent image bearing member;

a fourth step ef repeating said first, second and third steps to form on the visualized image bearing member a multicolor image which consists of plural visualized images and

which corresponds to one final image to be recorded, wherein when said second step is repeated, a visualized image is formed with a developer of a color which is different from a color with which the first mentioned second step is performed; and

a fifth step of transferring by pressure all at once the multi-color image to a recording material by passing the recording material through the nip formed between the latent image bearing member and the visualized image bearing member bearing the multi-color image.

4,682,881

APPARATUS FOR PRODUCING AN ELECTROPHOTOGRAPHIC PRINT

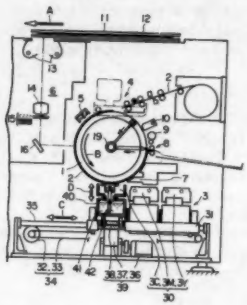
Shoji Komatsubara; Yukio Hatabe; Tooru Horikawa, all of Shigaken; Sadao Murasawa, Hyogoken, and Hajime Murakami, Shigaken, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto and Ishihara Sangyo Kaisha Ltd., Osakafu, both of, Japan

Filed Nov. 1, 1985, Ser. No. 794,185

Claims priority, application Japan, Nov. 22, 1984, 59-247672

Int. Cl.[4] G03G *15/10*

U.S. Cl. 355—10 **9 Claims**



1. An apparatus for producing an electrophotographic print on a photosensitive receptor movable through a plurality of predetermined stations so as to produce an electrostatic latent image on the photosensitive receptor, the apparatus comprising: a rotary drum having a peripheral surface defining an image forming section and a non-image forming section, the photosensitive receptor being placeable on the image forming section of the drum surface; a developing unit having at least one developing station for supplying a developer to the photosensitive receptor on the drum so as to make the electrostatic latent image visible; means for collecting the used developer from the photosensitive receptor, the collecting means being provided axially of the drum in the non-image forming section of the peripheral surface and including a suction opening on the drum surface connected to a sucking means provided externally of the drum, the suction opening being formed as a groove extending crosswise of the drum surface; and a developer absorbent material provided in the suction opening.

4,682,882

IMAGE RECORDING APPARATUS

Wahei Tokuda, and Atushi Takagi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 645,402, Aug. 29, 1984, abandoned. This application Jun. 4, 1986, Ser. No. 870,424

Claims priority, application Japan, Sep. 5, 1983, 58-161948

Int. Cl.[4] G03G *15/06, 21/00*

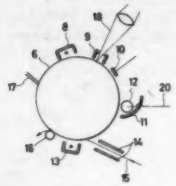
U.S. Cl. 355—14 D **16 Claims**

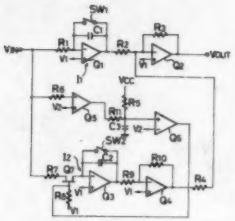
9. An image recording apparatus comprising:

image recording means for image recording on a recording member according to an original;

detecting means for detecting the image density of the original; and

control means for controlling the image recording conditions of said image recording means in response to data released from said detecting means;





wherein said control means is adapted to correct the data released from said detecting means in the event that the image density exceeding a predetermined value continues over a predetermined width.

4,682,883

PHOTOGRAPHIC COLOR ENLARGING OR COPYING APPARATUS

Werner Delueg, Vahrn, and Mario Gandini, Milland/Brixen, both of Italy, assignors to Durst Phototechnik GmbH, Bozen, Italy

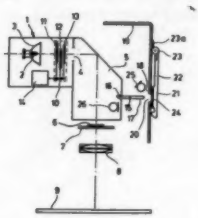
PCT No. PCT/EP85/00520, § 371 Date Jun. 6, 1986, § 102(e) Date Jun. 6, 1986, PCT Pub. No. WO86/02176, PCT Pub. Date Apr. 10, 1986

PCT Filed Oct. 4, 1985, Ser. No. 879,107

Claims priority, application Italy, Oct. 8, 1984, 4875 A/84

Int. Cl.[4] G03B *27/80*

U.S. Cl. 355—38 **8 Claims**



1. A photographic color enlarging or copying apparatus having a measuring device for determining the density in the colors red, green and blue of a test copy that is made from a selected reference original, a device for storing the measured results with respect to a target copy and means for the automatic modifying of the exposure conditions in the enlarging apparatus as a function of an existing difference of the measuring results between the test and the target copy, wherein the measuring device has light-guiding means (**15**) for illuminating

a measuring surface outside the path of the copying rays with light from the copying light source of the enlarging apparatus and photoelectric measuring sensors (25) are aligned with the measuring surface so that they receive measuring light reflected by the measuring surface and wherein the light measuring values of the reflected light are related to measuring values of the intensity of the light of the copying light source.

4,682,884

MECHANISM FOR ADJUSTING THE STARTING POSITION OF SLIDING TABLE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE

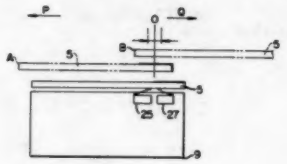
Akihiko Taniguchi; Takahiro Fukunaga, both of Nara, and Eiichi Shimizu, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1985, Ser. No. 806,491

Claims priority, application Japan, Jan. 8, 1985, 60-1325[U]

Int. Cl.[4] G03B *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **4 Claims**



1. In an electrophotographic copying machine comprising a document-carrying table which is movable along given directions at least between an initial position and an exposure position and a source unit which includes in a unitized structure a lamp light source and a mirror serving to initially reflect the reflected light from a document to be copied, the position of said source unit being adjustable at the time of assembly of said copying machine, the improvement wherein said copying machine further comprises an attachment member which is adjustable in said directions independently of said source unit and serves to adjust the distance between said initial position and said exposure position, and means for detecting said starting position of said table, said detecting means being secured to said attachment member.

4,682,885

ILLUMINATION APPARATUS

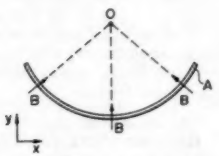
Makoto Torigoe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 729,056, Apr. 30, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,619

Claims priority, application Japan, May 2, 1984, 59-87879

Int. Cl.[4] G03B *27/54*

U.S. Cl. 355—67 **12 Claims**



1. An apparatus for illuminating an object, comprising:

means for producing a light beam;

means having an arcuate slit aperture, for restricting an area of illumination;

means for receiving the light beam produced by said light producing means to establish Kohler illumination for said restricting means, said Kohler illumination establishing means including a light integrator having a plurality of elements each having cylindrical parts extending in parallel in one direction, at least two of said elements being arranged so that the directions in which the cylindrical parts thereof respectively extend are different, and

means for forming an image of said restricting means, illuminatedin Kohler fashion by said Kohler illumination establishing means, at a predetermined position with respect to the object.

4,682,886

DISTANCE MEASURING DEVICE

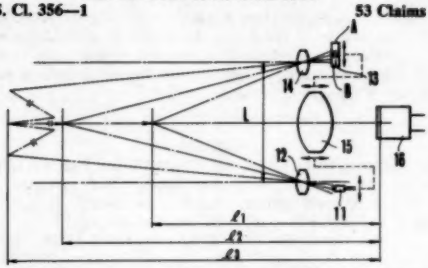
Masamichi Toyama, Tokyo; Naoya Kaneda, and Kazuo Fujibayashi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 476,241, Mar. 17, 1983. This application Aug. 20, 1986, Ser. No. 898,864

Claims priority, application Japan, Mar. 24, 1982, 57-46572; Mar. 31, 1982, 57-53013; Mar. 31, 1982, 57-53014; Mar. 31, 1982, 57-53015; Apr. 7, 1982, 57-57719

Int. Cl.[4] G01C *3/00;* **G03B** *3/00*

U.S. Cl. 356—1 **53 Claims**



1. A distance measuring device for measuring a distance to an object, comprising:

an imaging optical system for forming an image of said object at a predetermined position;

light projecting means for projecting light toward said object within a first plane containing the optical axis of said imaging optical system and said light projecting means; and

light receiving means for receiving light reflected from said object within a second plane containing the optical axis of said imaging optical system and said light receving means,

said first plane and said second plane being non-coplanar: and

a computing circuit responsive to said light receiving means to produce a signal related to the distance.

4,682,887

OPTICAL ASSAY FOR STORED HUMAN PLATELETS

Brian J. Bellhouse, The Lodge, North Street, Islip, Oxfordshire, and John W. Stairmand, Wirral, both of England, assignors to Brian J. Bellhouse, Islip, England

Filed Oct. 30, 1984, Ser. No. 666,390

Claims priority, application United Kingdom, Oct. 31, 1983, 8328979

Int. Cl.[4] G01N *33/48*

U.S. Cl. 356—39 **4 Claims**

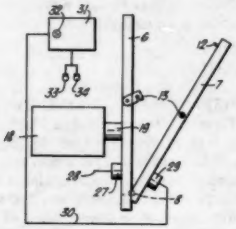
1. A device for use in a blood platelet monitoring assembly of the kind comprising at least one translucent pack of blood platelets comprising:

means for periodically agitating the pack to cause platelets in the pack to flow, said means for agitating including first and second surfaces between which the pack of platelets is adapted to be gripped,

light source means in one of said surfaces for irradiating the pack with light and causing light to be transmitted through the pack in a given direction,

photoelectric means in the other of said surfaces in a position

opposite to said light source means for collecting the light transmitted in said given direction and producing an electrical signal having an AC component with an amplitude equal to the difference between minimum and maximum levels of transmitted light, said AC component having a frequency equal to the frequency of periodic agitation, and



means responsive to said signal for extracting the AC component thereof, comparing the amplitude of the AC component with a reference datum and generating a visual display indicating one of acceptability or non-acceptability of the viability of the pack.

4,682,888

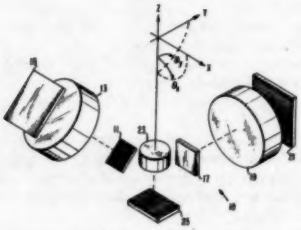
SPECTRAL ANALYZER AND DIRECTION INDICATOR

Jerome M. Welner, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 26, 1984, Ser. No. 686,363

Int. Cl.[4] G01N *21/01;* G01J *3/36;* G01B *11/26*

U.S. Cl. 356—73 **17 Claims**



1. A spectral analyzer and direction indicator system for receiving collimated or essentially collimated incident radiation comprising:

first optical means responsive to the collimated or essentially collimated incident radiation for providing first optical diffraction information which is a function of spectral content and incidence direction of the collimated or essentially collimated incident radiation;

second optical means responsive to the collimated or essentially collimated incident radiation for providing second optical diffraction information which is a function of spectral content and incidence direction of the collimated or essentially collimated incident radiation;

detector means illuminated by said first and second optical diffraction information for providing, as a function of the locations on said detector means illuminated by said first and second optical diffraction information, detected information for identifying as to the collimated or essentially collimated incident radiation both the spectral content and a first angular incidence direction;

third optical means for providing non-diffracted optical information which is a function of incidence direction of the collimated or essentially collimated incident radiation; and

further detector means illuminated by said non-diffracted optical information for providing, as a function of locations on said further detector means illuminated by said third optical information, detected information indicative of a second angular incidence direction of the collimated or essentially collimated incident radiation.

4,682,889

REFRACTOMETER FOR MEASURING THE REFRACTIVE INDEX OF A LIQUID

Alan L. Harmer, Plan Les Ouates, Switzerland, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

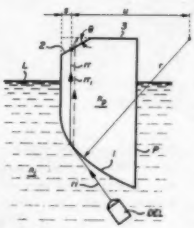
PCT No. PCT/CH84/00122, § 371 Date Apr. 2, 1985, § 102(e) Date Apr. 2, 1985, PCT Pub. No. WO85/00886, PCT Pub. Date Feb. 28, 1985

PCT Filed Jul. 31, 1984, Ser. No. 720,411

Claims priority, application Switzerland, Aug. 3, 1983, 4215/83

Int. Cl.[4] G01N *21/41*

U.S. Cl. 356—135 **4 Claims**



1. A refractometer for measuring a refractive index of a liquid to be measured, substantially independently of its temperature range, comprising:

a prism having a plurality of faces, at least one of the faces being in contact with the liquid to be measured;

light source means for directing a light beam through the prism to be incident upon, and pass through the one face and to be incident upon and pass through another face which is in contact with another medium, the one and the another faces of the prism traversed by the said beam forming corresponding non-right-angles with incident beams at the one and another faces;

wherein the other medium has a refractive index variation as a function of a temperature thereof which is lower than a refractive index variation of the liquid to be measured; and

a measuring scale structure, disposed in a location in which refracted light beams, refracted when passing from the liquid into the prism and when passing from the another face into the another medium, are substantially convergent;

the refractive index of the liquid varying as a function of a temperature range simultaneously affecting the liquid and the prism having one face in contact therewith.

4,682,890

MICROSAMPLE HOLDER AND CARRIER THEREFOR

Everly C. de Macario, Delmar; Robert J. Jovell, Albany, and Alberto J. L. Macario, Delmar, all of N.Y., assignors to Health Research, Incorporated, Albany, N.Y.

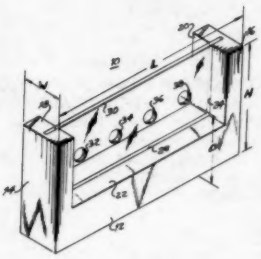
Filed May 31, 1985, Ser. No. 739,969

Int. Cl.[4] G01N *21/03;* C12M *1/18*

U.S. Cl. 356—244 **32 Claims**

1. Apparatus for use in a horizontal beam spectrophotometer in place of a conventional cuvette support that normally is used with said spectrophotometer and that carries a plurality of

cuvettes and includes one or more windows through which the beam passes to samples in said cuvetes; said apparatus comprising a carrier formed as a generally rectangular base having opposite ends, a bottom surface, a top wall and a slot in the top wall thereof, a pair of arms secured to said opposite ends of said base and extending upwardly from said top wall such that the height of said carrier from the top of either arm to the bottom surface of said base is substantially equal to the height of the conventional cuvette support, each arm having an inner wall that faces the inner wall of the other arm and in which is disposed a slot aligned with and meeting the slot in the top of



said base and extending substantially the length of said arm; and a microsample holder formed as a plate having a number of retaining elements for retaining drops of samples to be analyzed by said spectrophotometer, said plate being insertable in the slots of said carrier to position the plate on said base such that when said carrier is loaded into said spectrophotometer the retaining elements assume substantially the same position as the windows of said conventional cuvette holder.

23. A microsample holder for retaining at least one drop of liquid sample, comprising a thin, flat plate; and at least one circular opening in said plate having a diameter on the order of 3 mm for retaining said liquid sample therein.

4,682,891

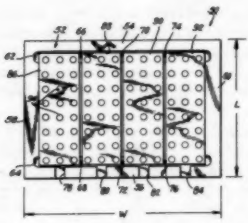
MICROCIRCLE SYSTEM

Everly C. de Macario, Delmar; Robert J. Jovell, Albany, and Alberto J. L. Macario, Delmar, all of N.Y., assignors to Health Research, Incorporated, Albany, N.Y.

Continuation-in-part of Ser. No. 739,969, May 31, 1985. This application Sep. 13, 1985, Ser. No. 775,582

Int. Cl.[4] G01N *21/03*; C12M *1/20*

U.S. Cl. 356—244 **31 Claims**



1. Apparatus for use in a conventional microtitration plate support in place of a microtitration plate that has a plurality of microwells, said apparatus comprising a generally rectangular base including a frame having plural sides, the frame being of height h substantially equal to the height of said conventional microtitration plate, length l substantially equal to the length of said conventional microtitration plate, and width w substantially no greater than the width of said conventional microtitration plate; a pair of support ledges extending toward the interior of said frame from opposite sides of said frame; and at least one tile formed as a thin sheet of material having an array of thin, flat retaining dishes for retaining drops of liquid samples, said tile having edge portions supportable on said pair of support ledges of said frame.

4,682,892

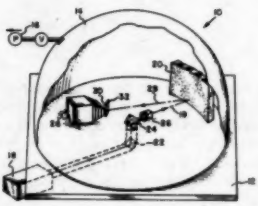
METHOD AND APPARATUS FOR SPECKLE-SHEARING INTERFEROMETRIC DEFORMATION ANALYSIS

Surendra K. Chawla, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 407,687, Aug. 13, 1982, abandoned. This application Aug. 30, 1985, Ser. No. 770,937

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—353 **10 Claims**



1. An apparatus for generating an interferogram for detection of subsurface voids, separations and nonuniformities of pneumatic tires comprising:

(a) a means for generating a beam of coherent light to illuminate and reflect light off of said pneumatic tire;

(b) a camera, including a photographic media and a converging lens comprising a double convex lens having one-half of one of its surfaces covered by a transparent plate having flat parallel sides oriented at a predetermined angular inclination with respect to an axis of the lens and an end contacting the surface of the double convex lens at its mid-point, said transparent plate adapted to displace laterally some of the light reflected from the pneumatic tire, and the converging lens adapted to receive light and focus it onto the photographic media to expose and record a focused image of interference fringes formed from two images of said tire, displaced with respect to one another and having a major portion of their areas overlapping; and

(c) a means for viewing the focused image of the pneumatic tire with interference fringes comprising a white light adapted to pass through a collimating lens for illuminating a first surface of the developed photographic media, that was exposed in said camera, such that said interference fringes appear on an opposite surface of said photographic media when viewed from a vantage point that is offset from the central axis of the collimating lens.

4,682,893

OPTICAL INTERFEROMETER WITH DISPERSION DEVIATOR

Errico Armandillo, Frascati; Gianemilio Salvetti, and Giampiero Giuliani, both of Rome, all of Italy, assignors to Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energie, Nucleare e delle Energie Alternative - ENEA, Rome, Italy

Filed Apr. 30, 1985, Ser. No. 729,114

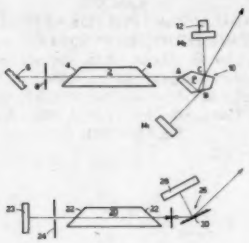
Claims priority, application Italy, Apr. 30, 1984, 48112 A/84

Int. Cl.[4] G01B *11/02*; H01S *3/08*

U.S. Cl. 356—356 **14 Claims**

1. An interferometer comprising a diffraction grating and first and second mirrors, said components being so disposed that the light beam inciding on the grating surface splits into a

first reflected part and one or more diffracted parts and that the diffracted part of a given order constitutes part of the interferometer transmitted beam while said first reflected part incides orthogonally on said first mirror and reflecting thereby reincides on the grating surface where it splits into a second reflected part as a constituent part of the interferometer reflected beam and into more diffracted parts of which one, of the above



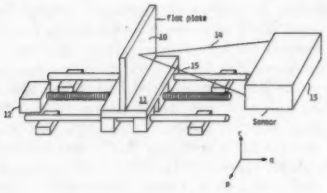
given order, orthogonally incides on said second mirror and is reflected thereby, reinciding on the grating surface where it splits into a third reflected part as constituent part of the interferometer transmitted beam and into one or more diffracted parts of which one, of the above given order, orthogonally incides on said first mirror whereby the latter part begins again the path already traveled.

4,682,894

CALIBRATION OF THREE-DIMENSIONAL SPACE

Richard Schmidt, Huntington; Howard Stern, Greenlawn; Alex Mauro, Wheatley Heights, and Joseph Ross, Fort Salonga, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,253
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—375 **16 Claims**



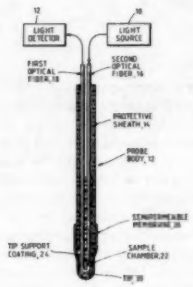
1. A method of calibrating three-dimensional measurement sensors comprising the steps of: placing a first flat plate in a sensor volume to be calibrated; adjusting said first plate surface to be orthogonal to a horizontal centerline of the sensor; translating said first plate along said sensor centerline while recording distance traveled; associating said distances with measured depth by said sensor; determining deviations from orthogonality of said translation relative to said first plate surface and correcting said measured depth accordingly; removing said first plate and placing a second flat plate in said sensor volume with said second plate surface at a first predetermined angle to said translation direction sloping vertically and parallel horizontally to said first plate surface; translating said second plate along said sensor centerline while recording distance traveled; associating said distances with measured height by said sensor in accord with vertical slope; determining deviations from said first predetermined angle and said horizontal parallelism of said second plate surface and correcting said measured height accordingly; removing said second plate and placing a third flat plate in said sensor volume with said third plate surface at a second predetermined angle to said translation direction sloping horizontally and parallel vertically to said first plate surface; translating said third plate along said sensor centerline while recording distance traveled; associating said distances with measured lateral distance by said sensor in accord with horizontal slope; determining deviations from said second predetermined angle and said vertical parallelism of said third plate surface and correcting said measured lateral distance in accordance with said deviations.

4,682,895

FIBER OPTIC PROBE FOR QUANTIFICATION OF COLORIMETRIC REACTIONS

David Costello, College Station, Tex., assignor to Texas A&M University, College Station, Tex.

Filed Aug. 6, 1985, Ser. No. 763,019
Int. Cl.[4] G01J *3/50*
U.S. Cl. 356—402 **17 Claims**



1. An optical probe for colorimetric measurement, comprising:

(a) an optical fiber, having an outer diameter and having light input and output ends for accepting the mounting of optical couplers to enable the transmission of light through said optical fiber, said optical fiber being doubled and having a sharp, 180° bend at a point along its length so as to form a tip, the bend radius of said sharp 180° bend being approximately equal to or less than the outer diameter of said optical fiber, said optical fiber having a small slice extracted from it at a point along its length spaced away from the tip so as to separate said optical fiber into two sections, each section having a face, the respective face of one section linearly displaced from the face of the other section, said displacement of said faces forming an optical gap;

(b) a tip support coating, said tip support coating covering the tip and further extending back along and covering the doubled length of said optical fiber for a distance beyond the optical gap, said tip support coating having a sample chamber which opens on the surface of said tip support coating and which extends into the interior of said tip support coating so as to expose the faces of said optical fiber at the optical gap;

(c) a colorimetric substance, said colorimetric substance filling the sample chamber, said colorimetric substance being permeable to a chemical of which properties are to be colorimetrically measured; and

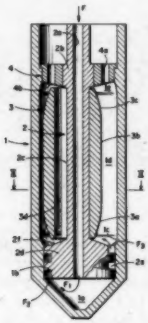
(d) a semipermeable membrane, said semipermeable membrane being applied to the surface of said tip support coating so as to cover the opening of the sample chamber.

4,682,896

DEVICE FOR GENERATING VIBRATIONS

Esref Halilovi , D. Tucovi a 141, 11000 Beograd, Yugoslavia

Filed Dec. 31, 1985, Ser. No. 814,971
Claims priority, application Yugoslavia, Mar. 4, 1985, 329/85
Int. Cl.[4] B01F *11/00*
U.S. Cl. 366—120 4 Claims



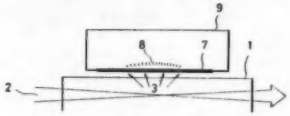
1. Device for generating vibrations, having a housing of a circular cross-section with a stationary shaft coaxial with it, on which stationary shaft there is suspended a sleeve-shaped working body, which is urged in swinging/rolling motion by means of a compressed fluid which, when exhausted, leaves the inside of the housing in axial direction, said housing including a cover, wherein the stationary shaft (2) is shaped as a hollow shaft and is provided at its free end with a cylindrical collar section (2*d*), which is pressed into the housing (1) to divide the inside thereof into an auxiliary chamber (1*a*) and a main working chamber (1*c*, 1*d*, 1*e*), which chambers communicate by at least one coil chamber (2*e*) which is provided on a mantle surface of the cylindrical collar section (2*d*), the inner radial surface of which is tapered and stimulates the working body (3), whose (axial) length is smaller than that of the working chamber (1*c*, 1*d*, 1*e*), to be suspended on the shaft (2).

4,682,897

LIGHT SCATTERING MEASURING APPARATUS

Kenji Saito, Tokyo; Ken Eguchi, Yokohama; Haruki Kawada, Kawasaki; Yoshinori Tomida, Yokohama; Yukuo Nishimura, Sagamihara, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1985, Ser. No. 804,108
Claims priority, application Japan, Dec. 10, 1984, 59-259072; Dec. 10, 1984, 59-259073; Dec. 10, 1984, 59-259074; Dec. 10, 1984, 59-259075; Dec. 10, 1984, 59-259076
Int. Cl.[4] G01N *21/41, 25/72*
U.S. Cl. 374—45 17 Claims



1. A scattered light measuring apparatus, usable to measure the light scattering properties of an object to be examined, said apparatus comprising:

light applying means for applying intermittent light to the object to be examined,

a photosensitive medium having an absorbing layer on a detector disposed along and out of contact with the surface of the object to be examined, said absorbing layer being capable of absorbing scattered light intermittently emitted from the surface of the object to be examined depending on the physical properties of the object when exposed to said intermittent light and converting the absorbed scattered light into a molecular vibrational energy signal,

energy signal detecting means for detecting the energy signal produced in said photosensitive medium, and

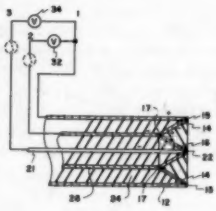
molecular vibration measuring means for measuring the molecular vibrational energy by synchronizing the detected energy signal with a reference frequency signal from said light applying means.

4,682,898

METHOD AND APPARATUS FOR MEASURING A VARYING PARAMETER

John E. Janssen, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 6, 1985, Ser. No. 741,775
Int. Cl.[4] G01K *7/04*
U.S. Cl. 374—179 4 Claims



1. A system for measuring a varying parameter comprising in combination:

a thermopile having a first and a second circumferential junction, one point junction, and means to thermally insulate said first circumferential junction relatively to said other two junctions; said first circumferential junction producing a first output signal;

said second circumferential junction and said point junction producing a second output signal;

means for periodically sampling said first and second output signals; and

means responsive to said first and second output signals at the beginning and end of a sample;

said responsive means producing an output signal which is a function of the difference between a change in said first output signal between the beginning and end of said sample period and the change in said second output signal between the beginning and end of said sample period.

4,682,899

FEED BEAM FOR A ROCK DRILL

Lars G. R. Andersson, Örebro, and Stefan H. G. Schörling, Arboga, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 728,594, Apr. 29, 1985, abandoned. This application May 16, 1986, Ser. No. 865,935
Claims priority, application Sweden, Apr. 27, 1984, 8402315
Int. Cl.[4] F16C *29/02*
U.S. Cl. 384—41 10 Claims

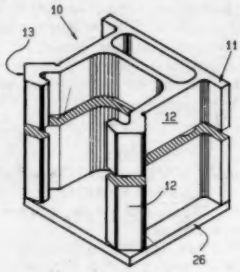
1. Apparatus for guiding the sliding movement of an object in contact therewith, comprising:

an elongated beam having a transverse cross-section which includes a shaped peripheral surface bounded at its ends by retaining portions angled with respect to said peripheral surface, said shaped peripheral surface comprising two flat surfaces joined at a first angle to each other and

a bent plate having an inner surface shaped to substantially

conform to said shaped surface of the beam and bounded at its ends by edge means angled with respect to said inner surface, said shaped surface of the plate comprising two flat surfaces joined at a second angle to each other,

said first and second angles being, respectively, between 60° and 120°,



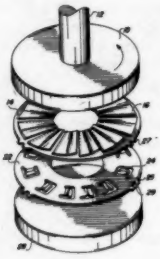
said edge means being suitably angled relative to said retaining portions to enable said bent plate to be snapped onto said elongated beam and for resiliently grasping said retaining portions to fixedly secure the bent plate to the beam so that the respective shaped surfaces are in contact to thereby position an outer surface of said bent plate to serve as the guide for said sliding movement.

4,682,900

THRUST BEARING UNDERSPRING

Alston L. Gu, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 19, 1985, Ser. No. 811,972
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—105 **42 Claims**



1. A fluid thrust bearing comprising:

a thrust runner;

a thrust plate to rotatably support the thrust runner; and

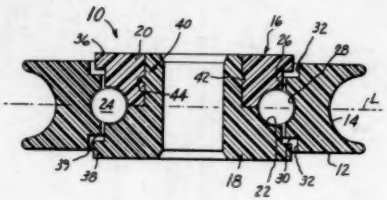
a compliant foil bearing operably disposed between said thrust runner and said thrust plate and mounted on said thrust plate, said compliant foil bearing including a thrust disk having a plurality of converging surface individual compliant foils disposed towards said thrust runner and a foil stiffener disk disposed between the thrust disk and the thrust plate, the foil stiffener disk including a plurality of integral tabs formed from said foil stiffener disk and extending towards said thrust disk in the direction of rotation of said thrust runner with an individual tab generally disposed in a supporting relationship towards an individual foil on said thrust disk and said tabs divided into at least two prongs having a generally arcuate curvature.

4,682,901

BALL BEARING APPARATUS HAVING SNAP FIT FEATURE

Peter Hauber, 9001 N. Glenoaks, Sun Valley, Calif. 91352

Filed Sep. 29, 1982, Ser. No. 426,806
Int. Cl.[4] F16C *43/04, 13/00, 33/60*
U.S. Cl. 384—539 **10 Claims**



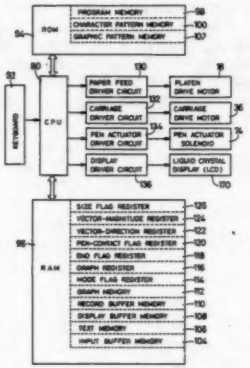
1. In ball bearing apparatus comprising a plurality of discrete anti-friction bearing elements, an outer ring defining a first curved bearing surface on its inner periphery, and an inner ring adapted to axially trap said outer ring and having a first section of an inside diameter adapted to encircle and engage a shaft and a second section of relatively larger diameter and adapted to encircle said first section encircling said shaft and without engaging said shaft said sections jointly defining a second curved bearing surface opposite said first bearing surface, apparatus locking means comprising a radially disposed, cooperating rib and groove structure on said inner ring sections, said structure being formed coaxial and parallel to the locus of said bearing surfaces and axially spaced therefrom, said sections being locally radially deflectable in the region of said structure in snap-fit section-joining relation at said locking structure.

4,682,902

WRITING PLOTTING APPARATUS WITH KEYBOARD

Hiroshi Onoda, and Kenji Mizuno, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 675,287, Nov. 27, 1984, abandoned.
This application Feb. 7, 1986, Ser. No. 827,198
Claims priority, application Japan, Nov. 30, 1983, 58-225838; Nov. 30, 1983, 58-225839
Int. Cl.[4] B41J *3/04*
U.S. Cl. 400—18 **14 Claims**



1. An integral writing/plotting recording apparatus, comprising:

a main housing;

a keyboard mounted to said main housing and having char-

acter keys corresponding to characters, function keys, and mode selecting means for selecting one of a writing mode and a plotting mode, said character keys including letter keys corresponding to letters, and numeral keys corresponding to numerals, said function keys including a start key;

a paper feeding device mounted to said housing for feeding a sheet of paper;

a carriage mounted to said housing for supporting a writing instrument, such that the carriage is movable in a direction substantially perpendicular to a feeding direction of said sheet of paper;

a carriage driving device for reciprocating said carriage in said substantially perpendicular direction;

a writing-instrument driving device for moving said writing instrument between a first position in which the writing instrument is in contact with said sheet of paper, and a second position in which the writing instrument is held away from the sheet of paper;

a character pattern memory within said housing for storing sets of character data representative of patterns of said characters;

a graphic pattern memory within said housing for storing sets of graphic pattern data respectively representative of a plurality of graphic patterns selected from the group consisting of a bar graph, a broken-line graph and a circular graph, said plurality of graphic patterns being selected by said numeral keys;

a graph memory within said housing for storing numerical graph data which is entered through said numeral keys and which is plotted in the selected graphic pattern; and

control means within said housing for receiving input data from said keys and mode selecting means of said keyboard and controlling said paper feeding device, carriage driving device and writing-instrument driving device, responsive to said input data including said numerical graph data, according to the following steps:

(a) waiting for entry of first input data through said keyboard;

(b) determining if the apparatus is already in said plotting mode;

(c) if the apparatus is not already in said plotting mode, determining if said mode selecting means has been operated to select said plotting mode and, if so, establishing said plotting mode;

(d) when said first input data is entered, and if the apparatus is already in said plotting mode or if said plotting mode has been established by said mode selecting means, checking if the first input data is a first set of numerical data entered through at least one of said numeral keys and, if so, reading in from said graphic pattern memory the set of graphic pattern data which corresponds to a graphic pattern designated by said first set of numerical data;

(e) when second input data is entered after said first set of numerical data has been entered, checking if the second input data is another set of numerical data and, if so, storing said another set of numerical data as said numerical graph data in said graph memory;

(f) repeating step (e) until said start key has been operated;

(g) if said start key has been operated in said plotting mode, controlling said paper feeding device, said carriage driving device and said writing-instrument driving device to print a graph according to the set of graphic pattern data which has been read in, and said numerical graph data stored in said graph memory; and

(h) if the apparatus is not already in said plotting mode, and if said mode selecting means has not been operated to select said plotting mode, performing in a writing mode by reading in from said character pattern memory the sets of character pattern data corresponding to the character keys operated, and controlling said paper feeding device, carriage driving device and writing-instrument driving device so as to print said characters on said sheet of paper.

4,682,903

THIN LINE PRINTER TYPING HEAD

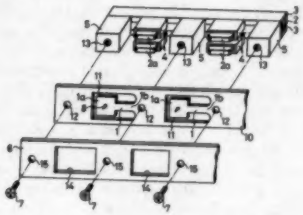
Kazuhiro Agata, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Apr. 1, 1985, Ser. No. 718,387

Claims priority, application Japan, Mar. 30, 1984, 59-62840; May 31, 1984, 59-111623

Int. Cl.⁴ B91J *3/10*

U.S. Cl. 400—121 **7 Claims**



1. A thin line printer typing head comprising:

a yoke assembly including a yoke, a magnet mounted on said yoke and a plurality of coils mounted on said yoke;

means defining a plurality of horizontally extending leaf springs, each spring extending from a fixed end to a free end mounting a hammer pin and displaceable by actuation of an associated coil, said defining means having a flat spring plate with portions removed to define said springs with aid fixed and free ends of said springs together extending in a horizontal line, said spring plate surrounding said spring free ends;

means for mounting said yoke assembly to said leaf springs defining means; and a horizontally extending clamp plate for clamping said leaf spring and said yoke assembly together, said clamp plate having apertures surrounding said leaf springs.

4,682,904

PAPER FEED MECHANISM FOR PRINTER

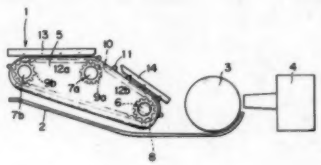
Masato Yoshimura, and Ryouhei Ohsaki, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,075

Claims priority, application Japan, Jul. 23, 1984, 59-110277[U]

Int. Cl.⁴ B41J *11/30*

U.S. Cl. 400—616 **4 Claims**



1. A paper feed mechanism for feeding continuous paper having perforations defined at equal intervals in each of side margins thereof, comprising:

(a) a pin tractor unit having an upper side and a lower side opposite to and below said upper side, said pin tractor unit including a toothed drive pulley and toothed idler pulleys and an endless tractor belt trained around said toothed pulleys, said belt having a plurality of pins projecting on an outer peripheral surface of said belt for fitting in the perforations in the continuous paper, and teeth formed on an inner peripheral surface of said belt and held in meshing engagement with said toothed pulleys;

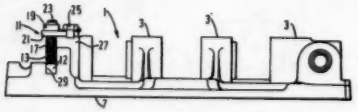
(b) a platen rotatable about its own axis;
(c) a print head disposed adjacent to said platen on one side of said platen, said pin tractor unit being positioned on an other side of said platen opposite said one side;
(d) a paper guide plate disposed below and opposing said lower side of said pin tractor unit and having an end portion extending along an outer circumferential surface of said platen;
(e) said tractor belt trained around said toothed pulleys having a first guide passage on said upper side above said pin tractor unit and a second guide passage on said upper side inclined downwardly from said first guide passage toward a position beneath said platen; and
(f) means for rotating said toothed drive pulley selectively in one direction or the other, whereby the continuous paper can be fed in a first direction in a path successively between said paper guide and said pin tractor unit, around said platen, and through said first guide passage with said pins fitting in the perforations in the continuous paper along said first guide passage, by rotating said toothed drive pulley in said one direction, and can be fed in a second direction in a path successively through said second guide passage with said pins fitting in the perforations in the continuous paper along said second guide passage, and around said platen, by rotating said toothed drive pulley in said other direction.

4,682,905

BRAKE PAD RETAINING PLATE ASSEMBLIES FOR USE IN BRAKE SHOE ASSEMBLIES

Kenneth Riding, Liverpool, and John Adamson, Wirral, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Feb. 6, 1986, Ser. No. 826,629
Claims priority, application United Kingdom, Feb. 6, 1985, 8502953
Int. Cl.[4] B25G *3/18*; F16B *21/00*
U.S. Cl. 403—327 **8 Claims**



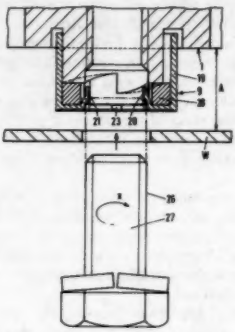
1. A pad retaining plate assembly for use in a shoe brake assembly, said pad retaining plate assembly comprising a retaining plate which has a pair of bolts screwed into parallel bores in one end face of said plate, each bolt having an elongate shaft and a head, the shafts of said bolts extending through aligned bores in first and second relatively movable plate members, and a spring engaged over the shaft of each bolt, engaging against said retaining plate and biassing said plate members towards the heads of the bolts to allow resilient movement of said retaining plate relative to said plate members, the plate member nearest the retaining plate being adapted to be secured to a shoe plate of the shoe brake assembly.

4,682,906

DEVICE FOR THE CLAMPING CONNECTION OF STRUCTURAL PARTS WHICH ARE SPACED FROM EACH OTHER

Edward Rückert, Wuelfrath, and Gerhard Gölz, Velbert, both of Fed. Rep. of Germany, assignors to Ewald Witte & Co., Velbert, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,901
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 3436166; European Pat. Off., May 23, 1985, 85106335.4
Int. Cl.[4] B25G *3/00*; F16B *2/14*
U.S. Cl. 403—409.1 **12 Claims**



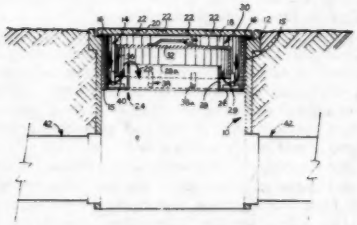
1. A device for the clamping connection of structural parts which are spaced from each other by a space, comprising
a spacer disk arranged within said space and having an outer broad side engagable against one of the structural parts, the spacer disk includes helical first pitched bearing surfaces,
form-fitting helical mating second pitched bearing surfaces coordinated with the other structural part are located facing said first pitched bearing surfaces, rotation of the bearing surfaces with respect to each other determining an axial position of said spacer,
a fastening screw having a wall surface,
said fastening screw engages said structural parts, the wall surface of said fastening screw forms an operative connection with said spacer disc so as to carry said spacer disk along therewith, during turning of said screw, into a bearing position of said outer broad side of said spacer disk against said one structural part.

4,682,907

SELF SEALING SEWER COVER ASSEMBLY

Carl J. Gaudin, 9526 Foster Rd., Baton Rouge, La. 70811

Filed Apr. 1, 1986, Ser. No. 846,751
Int. Cl.[4] E02D *29/14*
U.S. Cl. 404—25 **17 Claims**



1. A self sealing sewer cover assembly for preventing flammable gases from escaping from a sewer inlet comprising:

a. insert means having a top end and a bottom end for connection to a sewer inlet having generally vertical interior walls, said insert means having generally vertical walls on the exterior thereof for parallel alignment with said generally vertical interior walls of said sewer inlet,

b. trough means connected to said bottom end of said insert means and extending completely around the interior of said generally vertical walls of said insert means for containing water, said trough means having an inner generally vertical wall defining an opening through which water overflowing from said trough means can flow, said inner generally vertical wall of said trough means having a height less than the height of said generally vertical wall of said insert means,

c. a lid means lying in said trough and over and around said opening to prevent gases from traveling through said opening when said trough means is filled with water while permitting liquids to flow through said opening, and

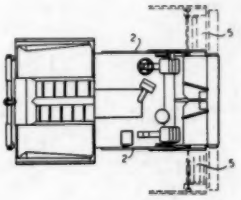
d. a cover means lying on top of said insert means, said cover means having a plurality of channels therein through which liquids may flow.

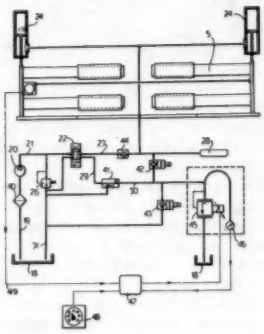
4,682,908

DEVICE FOR CONTROLLING THE PRESSURE UPON THE GROUND OF A SCREED UNIT OF VIBRATING FINISHING MACHINE FOR ROAD PAVING

Domenico Domenighetti, Lugano, Switzerland, assignor to Simesa-Societa Italiana Montaggi e Servizi Affini S.p.A., Milan, Italy

Filed Aug. 6, 1985, Ser. No. 763,263
Claims priority, application Italy, Sep. 4, 1984, 22511 A/84
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—84 **2 Claims**





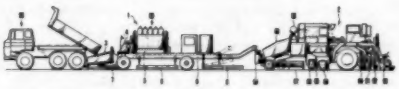
1. Device for automatically controlling the pressure exerted on road paving material by an extensible screed of a finishing machine, said screed comprising a hydraulically laterally extensible member (5) connected to symmetric elements (4) having bottom surfaces (6) that engage the ground when extended, such that the overall width of the extensible screed is determined by the position of the screed symmetric sections (4), said device comprising: hydraulic actuators (24) controlling the motion of said symmetric members (4) and said extensible members (5) and capable of lifting said screed; an electro-hydraulic circuit for regulating pressure of hydraulic fluid circulated within said actuator for varying the vertical position of said screed and means responsive to the amount of lateral extension of said extensible member (5) to adjust the pressure in said circuit for keeping constant the pressure per unit of area of said bottom surfaces (6) of said screed on said road paving material, said circuit keeping said pressure per unit of area constant independently of the overall width of the extensible screed, said electro-hydraulic circuit further comprising a hydraulic circuit for circulating said hydraulic fluid and an electric circuit for transmitting signals which act upon said hydraulic circuit to adjust the pressure of said fluid in said actuators, said hydraulic circuit comprising a tank (18) for said hydraulic fluid, a suction pipe (19) and a pump (40) for drawing fluid from said tank, a filter (20) for filtering fluid delivered from said pump, a high pressure delivery pipe (21) for conveying fluid from said filter, a maximum pressure regulator (26) for said high pressure delivery pipe (21) which regulates the pressure and which has a return tube to discharge fluid back into said tank (18) via a return pipe (31), said high pressure delivery pipe (21) also being connected to a distributor faucet (22), said faucet delivering fluid into a first delivery pipe (23) or a second delivery pipe (29), said first delivery pipe (23) having a non-return valve (44) and an accumulator chamber (28), said second delivery pipe (29) being connected to a priority valve (41), said priority valve functioning to channel a predetermined amount of fluid into a third delivery pipe (30) and to discharge an excess of fluid into said return pipe (31), said fluid from said third delivery pipe (30) flowing to a pressure regulating valve (45) and an electro-pressure gauge (46) and said fluid from said first delivery pipe (23) flowing to said actuators (24).

4,682,909

PAVED ROAD SURFACE REPRODUCING APPARATUS

Tohru Mihara, Kyoto, Japan, assignor to Taisei Road Construction Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,674
Int. Cl.[4] E01C *23/12*
U.S. Cl. 404—90 **1 Claim**



1. A paved road surface reproducing apparatus comprising:

a first self-propelled, steerable working truck carrying thereon a road surface heater for heating the surface of a road paved with a bituminous material; a pair of gas cylinder tables disposed at the two side portions of said first working truck and movable upward and downward; a first hopper for receiving a bituminous mixture from the outside; and a first conveyor for conveying said bituminous mixture from said first hopper to the rear portion of said first working truck; and

a second self-propelled, steerable working truck carrying thereon a second hopper for receiving said bituminous mixture from said first conveyor; a second conveyor for conveying said bituminous mixture backward from said second hopper; scattering means for scattering a powdery oil-absorber; a road surface heater having a width which is substantially equal to and a length which is less than that of the road surface heater of the first truck so as to have a smaller maximum heat capacity; a scarifier; softening agent scattering means; and a rotor adapted to have a portion thereof at a level below said road surface, and arranged in tandem in rear portions of its body with: a first

screw spreader adapted to have its lower end face at a level below a level of said road surface; a first screed adapted to have its lower end face at a level below a level of said road surface; a second screw spreader; and a second screed such that they are disposed in the order recited from the front toward the rear of said second working truck.

4,682,910

MARKING SYSTEM

Edmund D. Hollon, 130 Frontier Ave., and Blake D. Hollon, 1941 Park Dr., both of Douglas, Wyo. 82633

Filed May 13, 1986, Ser. No. 862,823
Int. Cl.[4] E02B 7/40
U.S. Cl. 404—94 **13 Claims**

1. A marking system for indicating the location of successively-spaced lanes on a running track having a predetermined width and a selected degree of curvature, said system comprising:

locating means positioned at a pivot point radially inward at a fixed distance from the innermost ones of said lanes to be marked on said running track;

an elongated boom assembly disposed laterally across said track, said assembly carrying a plurality of lane-marking devices individually spaced successively along its length in correspondence with the respective positions of said lanes;

means supporting said boom assembly for a movement along said track;

propulsion means coupled to one end portion of said boom assembly for propelling said one end portion along said track and around said pivot point;

aligning means associated with the other end portion of said boom assembly for enabling aligning movement of said other end portion of said boom assembly relative to said locating means to maintain said boom aligned lengthwise on a radius defined between the outermost end of said boom assembly and said pivot point;

and elongated alignment means for coupling one of said end portions to said locating means while enabling radially aligning movement of said other end portion.

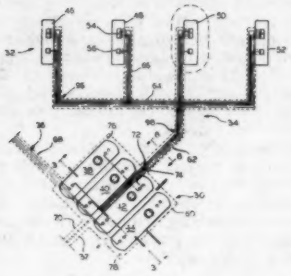
4,682,911

SECONDARY CONTAINMENT SYSTEMS ESPECIALLY WELL SUITED FOR HYDROCARBON STORAGE AND DELIVERY SYSTEMS

Jack Moreland, Dolton, Ill., assignor to MPC Containment Systems, Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 586,782, Mar. 6, 1984, abandoned. This application Mar. 8, 1985, Ser. No. 709,597
Int. Cl.[4] B65G 5/00
U.S. Cl. 405—53 **41 Claims**

1. A secondary containment system comprising a sheet of membrane material which is large enough to line at least a portion of a collection and containment pit along with trenches radiating therefrom, said trenches being graded to drain into the pit, there being a substantial amount of membrane bulk which enables it to bunch in at least an area of said pit and to provide sufficient slack to conform to irregularities on the walls and floor of the lined portion of the pit and trenches whereby localized stresses do not occur at places where the membrane bridges projections formed by the irregularities, corners, or the like, anchoring means independent of said membrane and surrounding at least part of the perimeter of said pit, means for attaching said anchoring means to the membrane to secure it and thus provide a shoring for walls of the pit by restraining movement of said membrane if there should be a cave-in of the pit for a period of time which is at least long



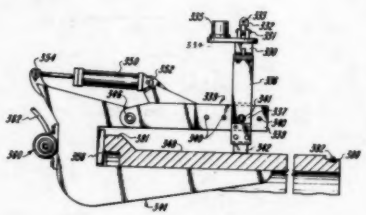
enough for workers to escape if there should be a cave-in; and means for closing and joining at least some sections of said membranes to preserve the integrity of a seal formed thereat in order to form a secondary containment enclosure.

4,682,912

PIPE LAYING APPARATUS

John T. Henry, P.O. Box 1472, Ft. Collins, Colo. 80522

Continuation-in-part of Ser. No. 56,456, Jul. 10, 1979, Pat. No. 4,362,435. This application Dec. 9, 1980, Ser. No. 214,500
Int. Cl.[4] F16L 1/02
U.S. Cl. 405—154 **4 Claims**



1. Apparatus for laying and joining successive sections of pipe, comprising:

a vehicle movable over a course along which said pipe is to be laid;

a crane carried on said vehicle and having an outer end portion movable both vertically and horizontally relative to said course;

a controllable grapple mounted from said outer end portion and engageable with a section of said pipe, operation of said grapple together with said crane enabling a section of said pipe to be picked up, moved into position over and deposited along said course;

a vibrator mechanically coupled to said grapple for inducing vibration into said grapple and from said grapple into a section of pipe carried thereby as an end of that carried section is slidably mated with another section of said pipe lying along said course;

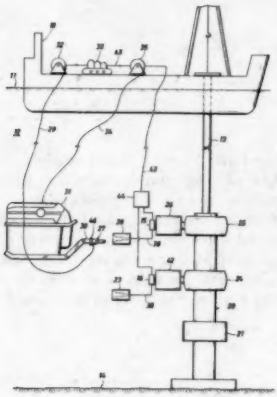
and in which said grapple includes a generally horizontal finger, a jaw spaced below said finger and having a size and shape to be inserted within the section of pipe for carrying the same and an element joining one end of said jaw to one end of said finger, said vibrator being affixed to said element.

4,682,913

HYDRAULIC STAB CONNECTOR

Howard L. Shatto, and Theodore L. Agon, both of Houston, Tex., assignors to Shell Offshore Inc., Houston, Tex.

Filed Aug. 28, 1986, Ser. No. 901,915
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—169 6 Claims



1. An apparatus for use in combination with a subsea equipment assembly located beneath the surface of a body of water having fluid conduit devices said apparatus comprising:

receptacle means supported by said subsea equipment assembly having a chamber and fluid conduit means defined therein, and being in fluid communication with said devices,

first probe body means having first and second shoulder means portions, said first shoulder means being formed at the end of the first probe body means entering said receptacle first and said second shoulder means axially displaced from said first shoulder means at a selected distance therefrom, said probe body means being enlarged in diameter at the top of said second shoulder means,

fluid conduit means carried by at least a portion of said first probe body means for supplying fluid from a source means outside said first probe body means to said fluid conduit means carried by said receptacle,

aligning means carried by said receptacle for positioning said first probe body means into said receptacle so that the longitudinal axis of said throughbore of said receptacle is aligned parallel to the longitudinal axis of said first probe body means in their operative position, wherein said aligning means includes two portions, the first portion of said receptacle causing coaxial alignment of said first probe body means, and a second portion at the entry-end of said receptacle, and

holding means carried by said first probe body means at one end thereof and adapted to be engaged when inserting the other end of the first probe body means into said receptacle.

4,682,914

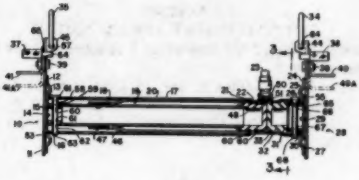
HYDRAULIC TRENCH SUPPORT

Isamu Aihara, 3-5, 3-chome, Nagaremachi, Hirano-ku, Osaka, and Tsuneo Yoshimura, 13-10, Nihombashi-Odemmacho, Chuo-ku, Tokyo, both of Japan

Filed Dec. 23, 1985, Ser. No. 811,998
Int. Cl.[4] E02D *17/08*
U.S. Cl. 405—283 5 Claims

1. A hydraulic trench support comprising:

an expandable hydraulic assembly having a cylinder having an interior passage terminating in first and second open ends and defining an annular snap ring groove near said first end of said cylinder and a taper spaced from and extending inwardly from said snap ring groove, a snap ring expandably fitted within said snap ring groove, a cylinder head defining a tapered portion fitted within said first end of said cylinder and maintained in a fixed position within said interior passage by the cooperation of said tapers in one direction and by said snap ring in the other direction, a hollow piston rod within said cylinder interior passage having first and second ends, a piston attached to said first end of said piston rod, and means for transferring a fluid under pressure into or out of said interior passage between said piston and said cylinder head;



a first base having a first substantially planar load bearing surface and a first cylindrical cross-sectioned boss removably coupled to said second end of said piston rod, a first flange coupled to said first load bearing surface and extending in the opposite direction of said first boss, and first hanger means for attaching a supporting line to exert a lifting force upon said first base;

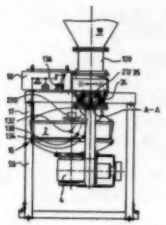
a second base having second substantially planar load bearing surface and a second cylindrical cross-sectioned boss removably coupled to said first end of said cylinder, a second flange coupled to said second load bearing surface and extending in the opposite direction or said second boss and second hanger means for attaching a supporting line to exert a lifting force upon said second base.

4,682,915

METHOD AND APPARATUS FOR CONTINUOUS GRAVIMETRIC METERING AND PNEUMATIC FEEDING OF POURABLE MATERIAL

Hans W. Häfner, Aichach Walchshofen, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 811,075
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520551
Int. Cl.[4] B65G *53/66*
U.S. Cl. 406—31 28 Claims



1. A method for ensuring proper operation of an apparatus for continuous gravimetric metering and pneumatic feeding of pourable material, including a rotor provided with laterally closed feeding pockets and tightly arranged in a housing for rotation about an essentially vertical axis, said housing being provided with a charging station and a discharging station and

connections for ducts for connecting a pneumatic feeding system, and being hinged for pivotal movement about an essentially horizontal axis at a support means, and a force measuring means is connected between said housing and said support means and to an evaulation means for controlling the angular speed of said rotor, said method comprising the steps of:

rotating said rotor;

applying varying pressure at said charging station and said discharging station:

determining any unbalance of said rotor; and

adjusting and fixedly securing the position of said essentially horizontal axis in respect of said support means based upon the determined unbalance of said rotor.

4,682,916

CUTTING INSERT ARRANGEMENT

Leonard A. Briese, 5039 Browndeed La., Rancho Palos Verdes, Calif. 90274

Division of Ser. No. 600,806, Apr. 16, 1984, Pat. No. 4,621,955. This application Jun. 23, 1986, Ser. No. 877,291

Int. Cl.[4] B23B *27/22;* **B23C** *5/02;* **B26D** *1/00*

U.S. Cl. 407—113 **68 Claims**

1. A cutting insert comprising, in combination:

a body member, having an outer peripheral surface, a central axis, a median plane substantially perpendicular to said central axis, a first end section extending in a first direction from said median plane and a second end section extending in a second direction, substantially opposite said first direction from said median plane;

said first end section having:

a first inner cutting surface tapering outwardly from said central axis in regions adjacent said median plane toward said outer peripheral surface;

said outer peripheral surface in said first end section defining a first outer flank surface tapering inwardly from regions adjacent said median plane in said first direction toward said central axis; and

said first flank surface intersecting said first inner cutting surface to define a first cutting edge;

whereby, said body member has a substantially increasing thickness from said first cutting edge toward said median plane.

4,682,917

SPADE BIT WITH FLUTED SHOULDERS

A. Graves Williams, III, Wilmington, and Ronald L. Thackston, Hillsboro, both of Ohio, assignors to The Irwin Company, Wilmington, Ohio

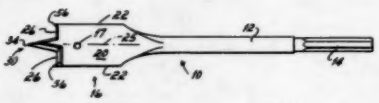
Filed Jan. 24, 1986, Ser. No. 822,234

Int. Cl.[4] B23B *51/00*

U.S. Cl. 408—212 **10 Claims**

1. In a spade boring bit of the type comprising a shank; a blade on the shank, said blade having parallel opposite faces with outer sides which are parellel to the axis of the shank; a central point extending axially from said blade; shoulders extending outwardly from said point toward said outer sides; said point having two converging sides leading from said shoulders and meeting at a tip, said point having a point flute adjacent each side thereof, each such point flute extending from the tip of the point to the respective shoulder; the improvement comprising,

cutting spurs projecting forwardly from the shoulders, each spur having an outer edge which is a continuation of the outer side of the blade and which is parallel to said axis, and an inner edge which forms a point with the said outer edge of the spur; and



a shoulder flute formed in each of said parallel opposite faces of said blade and adjacent the shoulder, each shoulder flute intersecting and extending outwardly in its respective face from the respective point flute perpendicular to the axis of said shank and toward the respective spur,

said outer edges of said spurs being sharp, said shoulder flutes terminating at the spurs so that the shoulder flutes do not extend across the spurs to the outer sides of the blades.

4,682,918

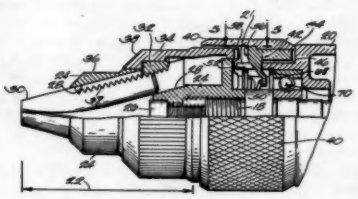
KEYLESS IMPACTING CHUCK

Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Continuation-in-part of Ser. No. 601,078, Apr. 16, 1984, abandoned. This application Mar. 4, 1985, Ser. No. 707,593

Int. Cl.[4] B23B *31/10*

U.S. Cl. 408—241 R **8 Claims**



1. In combination with a drill chuck of the type having a chuck body mounted on and rotatable with the drive spindle projecting from the gear case of a power drill,

a collar mounted on said body for rotation with and with respect to said body, said body supporting three jaws on inclined axes,

a threaded connection between said collar and said jaws whereby said jaws move on said inclined axes in response to relative rotation between said collar and said body,

the improvement comprising,

means for holding said collar against rotation with said chuck body,

said means including a sleeve mounted on said gear case for axial movement toward and away from said collar between first and second positions,

interference members on said collar and said sleeve operative when engaged to prevent rotation of said collar whereby rotation of said body causes said jaws to grip or release the shank of a tool,

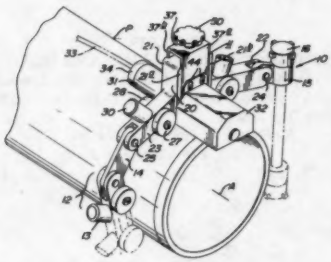
and spring means biasing said sleeve to one of said positions.

4,682,919

PORTABLE POWERED PIPE WORKING MACHINE

Joseph T. Mitchell, Waterford, Pa., assignor to Reed Manufacturing Company, Erie, Pa.

Filed May 5, 1986, Ser. No. 859,829
Int. Cl.[4] B26B *27/00*
U.S. Cl. 409—179 11 Claims



1. In a portable powered pipe cutter including movable cutting means adapted to engage and be moved about the outer periphery of a pipe to be cut, and adjustable link means connected to said movable cutting means and encircling said pipe, said adjustable link means being movable with said movable cutting means about the periphery of the pipe for permitting said movable means to be advanced manually in a guided path orthogonal to the longitudinal axis of the pipe, the improvement wherein said movable cutting means comprises:

a carriage having an upstanding protrusion with an inverted U-shaped configuration providing a downwardly open recess adapted to confront the outer periphery of the pipe and to extend outward therefrom, said carriage having a pair of arms extending in opposite directions from said protrusion, said arms being aligned with said adjustable link means and lying in the path of movement thereof about the pipe, each arm having an end connected to said adjustable link means and having means beween said end and said protrusion rotatably engaging the pipe surface,

rotary means disposed in said recess and extending transverse to the path of movement of the carriage and hence lengthwise of the pipe,

a yoke movably mounted on said carriage protrusion for mounting said rotary means for movement inwardly and outwardly of said pipe in said transverse relation relative to said recess and the confronting peripheral pipe surface, said yoke including a base extending across said protrusion and a pair of flanges depending therefrom on opposite sides of said protrusion in sliding engagement therewith for guiding said yoke relative to said protrusion,

adjustable means on said carriage and yoke for displacing said yoke relative to said carriage,

tool means adapted to be connected to said rotary means to one side of said carriage for operating on the pipe, and

coupling means adapted to connect said rotary means to a source of power,

whereby operations can be conducted on the pipe by rotating the carriage thereabout.

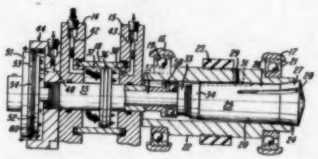
4,682,920

ROTATING AIR BEARING

James E. Rodgers, Kenton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Mar. 26, 1986, Ser. No. 644,094
Int. Cl.[4] B23C *1/02*; F16C *39/06*
U.S. Cl. 409—231 13 Claims

1. In a machine or like tool, a shaft adapted for rotary and axial shifting motions, intermediate support means for said shaft, said shaft extending in opposite directions from said support means, a fluid bearing for one extended end of the shaft including a bearing housing recessed to provide a fluid reservoir, and a piston-like bearing recessed in said housing and mounted on to move with said shaft, said bearing having a peripheral portion in an approaching relation to an interior surrounding wall of said housing whereby substantially to hold said housing and said shaft in a centered relation and whereby to define a wall of said reservoir, and a pressure fluid distributing and operating system including means for admitting pressure fluid to said reservoir, and means for reciprocating said bearing housing in an axial sense, the fluid in said reservoir being allowed to escape to ambient surroundings around the periphery of said piston-like bearing for an essentially frictionless contact of said peripheral portion with said housing wall and being used as a resilient link in actuating said shaft in one axial direction, said bearing housing being supported from said intermediate support means to be free of rotation with said shaft.



4,682,921

INSIDE-TUBE SCARFING TOOL

Lester J. Blaho, Ambridge, Pa., assignor to Pittsburgh Tube Company, Monaca, Pa.

Filed Nov. 8, 1985, Ser. No. 796,650
Int. Cl.[4] B23D *1/08*
U.S. Cl. 409—299 6 Claims

1. A scarfing tool for inside the tube scarfing comprising:

a. an elongated body having a cutting tool mounted thereon and adapted for connection to an impeder rod said elongated body having an axis running therethrough and parallel therewith;

b. first and second roller rotatably positioned at substantially opposing ends of said elongated body and adapted for contact with the inner surface of the tube to be scarfed;

c. a thrust roller pivotably mounted on the side of said body opposite from said first and second rollers for positioning said cutting tool adjacent the area to be scarfed, said thrust roller being retracted inside the elongated body when not actuated;

d. first and second hydraulic means having associated piston means, said first piston means contacting said thrust roller causing said thrust roller to pivot and press against the inside of the tube thus positioning said cutting tool adjacent the area to be scarfed when actuated, said first and second hydraulic means each having an axis parallel to the axis of the elongated body, with said first piston means moving in parallel to the axis of the elongated body when actuated;

e. a biasing means connected to and biased against said second piston means; and

f. a source of hydraulic fluid connected to said first and second hydraulic fluid means for actuating said first and second piston.

4,682,922

VEHICLE WHEEL SUPPORT AND FASTENING DEVICE

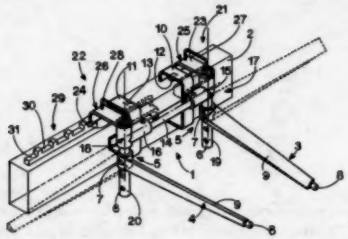
Jean-Luc Andre, Dangolsheim, and Christian Fity, Illkirch, both of France, assignors to Lohr S.A., Hengenbieten, France

Filed Oct. 2, 1985, Ser. No. 783,201

Claims priority, application France, Nov. 19, 1984, 84 17710

Int. Cl.[4] B60P *3/07*

U.S. Cl. 410—30 **10 Claims**



1. Device adapted to accomodate at least one wheel of a vehicle, particularly for use and installation in car-carriers, comprising in combination

an elongated side rail constituting a vehicle loading level,

a carrying trolley slidably arranged on said elongated side rail, said carrying trolley having pivotally mounted thereon a pair of elongated sustaining arms normally extending at a slight convergence to, but nearly parallel with one another in an operative position thereof, and being spaced from one another by a predetermined distance, but being pivotably foldable through respective angles of about 90° , so as to extend in parallel with said elongated side rail.

4,682,923

DEVICE FOR LOCKING A CONTAINER

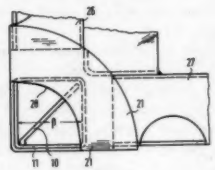
Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

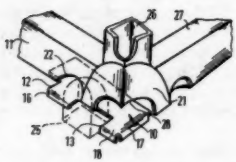
Filed Jan. 16, 1986, Ser. No. 819,366

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501969

Int. Cl.[4] B60P *7/13*

U.S. Cl. 410—90 **25 Claims**





1. A device for locking a container to locking members, the container including lower frame elements of hollow section and lower corner fittings each formed with a corner opening, said device comprising a locking piece movable within a respective one of said lower frame elements between a retracted non-use position in said hollow section in an in-use position, said locking piece including a portion adapted to extend outwards through the corner opening of the respective corner fitting when in said in-use position, said portion having a cut-out for engaging a respective locking member.

4,682,924

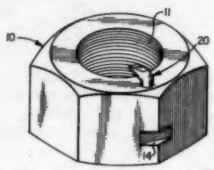
SELF-LOCKING NUT DEVICE AND METHOD

Jack R. Kerr, 1912 Peycos Dr. North; Gerald L. Dunsmore, and Thomas V. Shelton, both of 1916 Peyco Dr. North, all of, Arlington, Tex. 76017

Filed Jun. 4, 1985, Ser. No. 741,152

Int. Cl.[4] F16B *39/32*

U.S. Cl. 411—329 **11 Claims**



1. A method for fabricating a self-locking nut, including the steps

forming, in an annular nut body having a threaded bore, a small bore at one side thereof parallel to the thread axis of said threaded bore and opening to at least one face of said nut body;

forming an L-shaped anti-reversing pin from an elongated shaft of quarter hard stainless steel welding rod;

forming a locking recess on one leg of said pin, spaced longitudinally from said other leg facing away from the direction of said other leg;

mounting said anti-reversing pin on said nut body with said one leg of said pin confined in said small bore, and with said other leg of said pin extending toward said threaded bore for interference engagement with a mating bolt:

flowing metal of said nut body into said small bore and into engagement with said locking recess, to secure that portion of said pin to said nut body;

said other leg and the adjacent portion of said one leg thereby being oscillatable relative to said nut body between alternative anti-reversing positions relative to a mating bolt.

4,682,925

TACK STRIP

Thomas A. Shields, Bourne, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 11, 1985, Ser. No. 722,152

Int. Cl.[4] F16B *15/00*; A47G *27/04*

U.S. Cl. 411—461 **1 Claim**

1. A tack strip for securing upholstery fabric to an underlying frame structure comprising:

a. a strip of flexible metal material having a longitudinally extending centrally located fold forming upper and lower angularly disposed flanges;

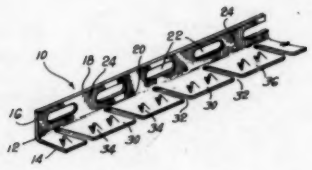
b. said lower flange having a continuous straight edge portion adapted to be aligned with a straight marginal edge of the frame structure;

c. said lower flange also including a plurality of equally spaced elongated openings along the longitudinal extend to said lower flange with spaced solid portions of said lower flange therebetween; said openings adapted to re-

ceive a staple fastener to secure said spaced solid portions and thus said lower flange to the frame structure;

d. said upper flange having a plurality of equally spaced slots extending to said fold to form a plurality of spaced tab members therebetween; each of said tab members having a width substantially greater than the width of the spacing therebetween and having spaced prongs;

e. said prongs being formed out of the surface of said tab members toward said lower flange, the fabric being adapted to be placed over said tab members and gripped by said prongs; said tab members being adapted to be progressively formed about said fold against said lower



flange to sandwich the fabric between said upper and lower flanges of the tack strip; and,

f. said prongs being angularly disposed out of the surface of said tab members in the direction of said fold so that upon forming said tab members about said fold, said prongs will abut the surface of said lower flange and form back toward the surface of said tab members to securely attach the fabric against the surface of said tab members;

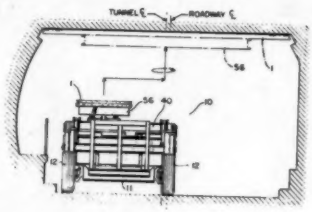
g. and wherein the spacing of said prongs from said fold is approximately equal to the spacing of said openings from said fold so that said prongs will interlock with the staple to pinch the fabric therebetween.

4,682,926

CEILING PANEL PLACING MACHINE

Sam W. Chambers, Meridian; Charles R. Spencer, and Wade E. Miller, both of Boise, all of Id., assignors to Morrison-Knudsen Company, Inc., Boise, Id.

Filed Jan. 2, 1986, Ser. No. 815,715
Int. Cl.[4] E04G *21/14*
U.S. Cl. 414—11 **10 Claims**



1. A machine for elevating and placing panels, comprising:

a frame supported by wheels permitting horizontal transport of said machine between panel receiving and panel placing positions, said frame including guides for guiding vertical elevation of said panels;

a plurality of outriggers, mounted upon said frame extendible downwardly to elevate, at a panel placing location, said frame and said wheels, and to partially advance said panel vertically toward placement;

a first elevating stage including sleeve members, slidably mounted upon said frame guides, said stage elevatable on said guides to partially advance said panel vertically toward placement, said first stage framework including longitudinal and upper transverse, with respect to said machine, supporting members;

elevating means affixed to said frame and attached to the first elevating stage to advance said stage vertically;

a second elevating stage having sleeve members slidably mounted on said guide sleeve members of said first elevating stage, said second stage having longitudinal and transverse supporting members;

elevating means, affixed to transverse members between said first and second stages, for elevating said second stage vertically along said first stage guides;

a first carriage, mounted on and slidably adjustable along said second stage longitudinal members, for shifting said panel into an approximate longitudinal placement location;

a second carriage, mounted on and slidably adjustable upon a transverse member of said first carriage, for shifting said panel transversely to said machine and into cantilevered transverse alignment with the center line of said panel placement, said carriage including a substantially centrally mounted, rotationally adjustable turntable bearing; and

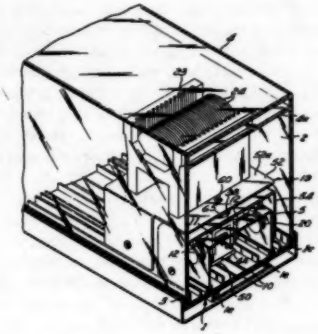
a panel-supporting table rotatably mounted upon said second carriage bearing, said table receiving panels in longitudinal alignment with said machine and rotating said panels into alignment for panel placement location, wherein the elevating stages elevate the panel to its placement level and the carriages shift and rotate said panel into transverse, end-to-end alignment for placement.

4,682,927

CONVEYOR SYSTEM

Peter R. Southworth, Mission Viejo, and Gregory R. Baxter, Orange, both of Calif., assignors to Nacom Industries, Incorporated, Tustin, Calif.

Continuation-in-part of Ser. No. 517,278, Jul. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 419,201, Sep. 17, 1982, Pat. No. 4,540,326. This application Nov. 16, 1984, Ser. No. 672,349
Int. Cl.[4] B65G *35/00*
U.S. Cl. 414—217 **28 Claims**



1. Apparatus for transporting a cassette of semiconductor wafers, from a first clean room, having a specified maximum number of particulate contaminates for a given volume of space, to a second clean room, comprising:

a first elevator station in said first clean room, said first elevator station including a housing enclosing both a chamber and a load receiving stall, both of which have a controlled environment;

first mechanical transfer means for extending into said stall and withdrawing the load to an elevator position within the chamber, said transfer means being laterally movable to releasably engage said load;

an elevator in said first elevator station for moving said first transfer means and the load to a desired level;

conveying means in a controlled environment for receiving the load from said first transfer means and for conveying said load to a second transfer means for withdrawing said load from the conveying means, said conveying means comprising:

an elongated, track-like support having a pair of inner tracks on the upper side of the support;

means on said support located between said inner tracks for conducting electrical power;

a driver cart riding on said inner tracks;

an electric motor included with the driver cart;

an electrical power pickup on the driver cart for transferring electricity from the power conducting means to the electric motor;

a generally U-shaped inner cover supported in an inverted orientation on said track-like support to form, with the support, an inner tunnel through which said driver cart can travel, said support having means spaced outwardly from said inner tracks to sealingly cooperate with the lower edges of the side legs of said cover;

a pair of outer tracks on said support including a track on each side spaced outwardly from but in close proximity to the means on the support for receiving the lower legs of said cover;

a driven cart having a generally U-shaped support structure positioned in an inverted orientation with an upper support surface and depending side legs, and having wheels rotatably mounted on the lower ends of said structure side legs, the driven cart wheels being aligned to ride on said outer tracks, with the side legs of the driven cart structure being spaced outwardly from the side legs of the inner cover to straddle and enclose the inner cover and the driver cart, said driven cart including an upper wall of the inner cover, said upper support surface being adapted to support a wafer cassette, remote from the wheels on said driven cart;

magnetic means on said driver cart extending outwardly in close proximity to the inner surface of said inner cover, and magnetic means on said driven cart structure extending closely adjacent to the outer surface of said inner cover and aligned with the magnetic means on said driven cart so that sufficient magnetic force can be exerted by the magnetic means on the driver cart to cause the driven cart to follow the motion of the driver cart;

an outer, generally U-shaped cover supported in an inverted orientation and fitting over the driven cart and the space to be occupied by said cassette on top of the driven cart so that the outer cover in combination with the inner cover and said support forms an outer tunnel through which said driven cart can travel, said support being formed with means on its upper surface spaced outwardly from said outer tracks for sealingly cooperating with the lower ends of the side legs of the outer cover;

a second elevator station in said second clean room, including a housing having a controlled environment and further including said second transfer means;

an unload stall and a second elevator cooperating with said second transfer means to move the load to the level of said unload stall and move the load into said unload stall; and

means for controlling the operation of the transfer means, the elevators and the conveying means to transfer a load from one elevator station to the other.

4,682,928

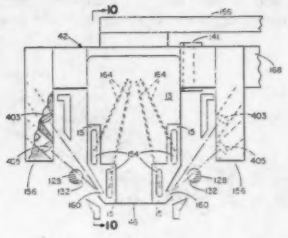
WAFER TRANSFER APPARATUS

Richard F. Foulke, Carlisle, and Steven M. Lord, Malden, both of Mass., assignors to Proconics International, Inc., Woburn, Mass.

Division of Ser. No. 381,292, May 24, 1982, Pat. No. 4,493,600. This application Nov. 2, 1984, Ser. No. 667,550

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—416 **3 Claims**



1. Apparatus for transferring semiconductor wafers, comprising

a wafer-pickup element with at least two openings each located closer to the edge of a wafer than to the wafer's center,

means for providing a below-atmospheric pressure or vacuum at said openings for the purpose of adhering a wafer to said wafer-pickup surface, and

individual pressure sensors connected to vacuum lines extending to each said opening, whereby wafers may be picked up with greater certainty as to the locations of their edges with respect to said pickup element, and initial contact of any one opening with a wafer can be sensed by a change in the output of that opening's pressure sensor.

4,682,929

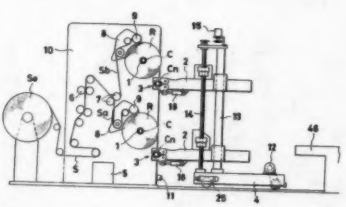
DEVICE FOR TAKING OUT SHEET ROLLS AND MOUNTING SHEET ROLL CORES

Hiroshi Kataoka, 3686, Sangawacho, Iyomishima-shi, Ehime 799-04, Japan

Filed Feb. 3, 1986, Ser. No. 825,756

Int. Cl.[4] B65H *19/30*

U.S. Cl. 414—589 **5 Claims**



1. A sheet winder with a slitter, in which sheet winder a strip-like sheet is slit by a slitter into a plurality of slit sheets to be supplied to respective take-up shafts disposed at take-up positions and taken up on cores supported on said take-up shafts, said sheet winder comprising:

(a) take-up shaft withdraw and restoring means for effecting withdraw of each take-up shaft from its take-up position in the axial direction of the shaft and for restoring the shaft to its take-up position;

(b) a movable sheet roll support movable in a direction normal to the axis of each take-up shaft at the take-up position so as to be moved to a sheet roll acceptance

position, a take-up shaft supply position, and a waiting position;

(c) a vertical guide post provided on said movable sheet roll support;

(d) at least one sheet roll holder capable of being raised and lowered along said vertical guide post and having an end portion extending toward a sheet take-up position;

(e) a sheet roll support base disposed for movement back and forth along said at least one sheet roll holder;

(f) core holding means provided on an end portion of said at least one sheet roll holder for holding a core parallel to the take-up shaft;

(g) means for positioning and driving said movable sheet support; and

(h) means for raising and lowering said at least one sheet roll holder.

4,682,930

APPARATUS FOR UPWARD AND DOWNWARD MOVEMENT OF AN ARM IN A ROBOT SYSTEM FOR TAKING OUT INJECTION MOLDED AND DIE CASTING PRODUCTS

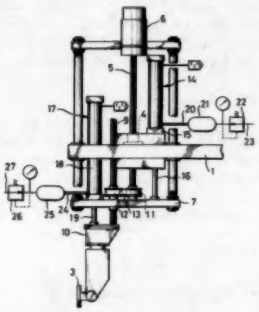
Kiyoji Hachisu, Maebashi, Japan, assignor to Ichikoh Engineering, Ltd., Maebashi, Japan

Filed Oct. 15, 1985, Ser. No. 787,238

Claims priority, application Japan, Jun. 5, 1985, 60-120620

Int. Cl.[4] B66F *9/00*; F16H *25/12*

U.S. Cl. 414—589 **4 Claims**



1. An apparatus for upward and downward movement of an arm in a robot system for taking out injection molded and die casting products, comprising:

a chuck;

a frame for connection to the arm;

means upwardly and downwardly movably supported by the frame for supporting the chuck;

drive equipment supported on the frame comprising a motor and means for upwardly and downwardly moving the chuck;

a first pneumatic cylinder having a volume and including a casing attached to the frame, a piston rod connected to the means upwardly and downwardly movably supported by the frame for supporting the chuch, and a rod end side;

a first surge tank having a volume larger than the first pneumatic cylinder volume and being connected to the rod end side of the first pneumatic cylinder;

a compressed air source for supplying upward pressure to the pneumatic cylinder;

a first reducing valve without relief means connected between the first surge tank and compressed air source;

wherein the means upwardly and downwardly movably supported by the frame for supporting the chuck comprises a lift frame supporting the chuck, an intermediate frame having the piston rod of the first pneumatic cylinder connected thereto, means for transmitting relative movement between the lift frame and intermediate frame, a second pneumatic cylinder having a volume and including a housing attached to the intermediate frame, a piston rod connected to the lift frame, and a rod end side, a second surge tank having a volume larger than the second pneumatic cylinder volume and being connected to the rod end side of the second pneumatic cylinder, and a second reducing valve without relief means connecting the second surge tank and the compressed air source; and

wherein the motor is nonrotatably but axially movably supported on the frame, and the means for upwardly and downwardly moving the chuck comprises a ball nut rotatably but axially unmovably supported on the frame, a first ball screw inserted axially movably but nonrotatably in the ball nut, the first ball screw having a first end connected to the output shaft of the motor and a second end rotatably but axially unmovably supported on the intermediate frame, a second ball screw rotatably and axially movably inserted in the intermediate frame, the second ball screw having a first end fixed to an end of the lift frame, and means for connecting the first and second ball screws with respect to each other in a synchronously rotatable manner.

4,682,931

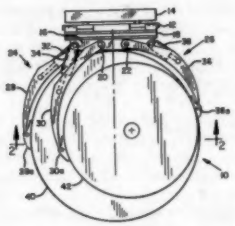
LIFT TRUCK CLAMP FOR HANDLING STACKED LOADS OF DIFFERENT SIZES

Marshall K. House, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Sep. 22, 1986, Ser. No. 909,961

Int. Cl.[4] B66F *9/18*

U.S. Cl. 414—623 **16 Claims**



1. A load-handling clamp adapted to be mounted upon the lifting apparatus of a lift truck, comprising:

(a) a frame adapted to be mounted upon said lifting apparatus so as to be selectively movable vertically by said lifting apparatus;

(b) first and second selectively openable and closable opposing clamping assemblies mounted upon said frame, the first clamping assembly comprising at least a pair of clamp arms movable separately from each other relative to said frame selectively toward and away from the second clamping assembly;

(c) a pair of fluid power actuators, each associated with a respective clamp arm, for moving said clamp arms separately from each other selectively toward and away from the second clamping assembly;

(d) a source of pressurized fluid connected to said pair of fluid power actuators for selectively causing said actuators to move said clamp arms toward said second clamping assembly by the supply of respective flows of fluid to said actuators;

(e) flow-regulating means connected to said pair of actuators for regulating said respective flows of fluid so as to cause the respective movements of said pair of clamp arms, in a direction toward said second clamping assembly, to be simultaneous with each other; and

(f) override means for overriding said flow-regulating

means, automatically in response to the attainment of a predetermined clamping force by one of said pair of clamp arms, by permitting the other of said pair of clamp arms to move in a direction toward said second clamping assembly without simultaneous movement in said direction by both of said pair of clamp arms.

4,682,932

INDUSTRIAL ROBOT

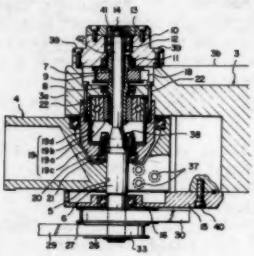
Shigeru Yoshino, Kodaira, Japan, assignor to Silver Seiko Limited, Kodaira, Japan

Filed Aug. 14, 1984, Ser. No. 640,696

Claims priority, application Japan, Aug. 18, 1983, 58-126840[U]

Int. Cl.[4] B25J *17/00*

U.S. Cl. 414—744 A **7 Claims**



1. An industrial robot of the type which includes a first arm having one end supported for pivotal motion about a first vertical axis, a second arm having one end supported for pivotal motion about a second vertical axis at the other end of said first arm, and a motor for pivoting said second arm, comprising:

a shaft providing said second axis;

means for supporting said shaft for rotation at a fixed vertical position at asid the other end of said first arm;

means for removably securing said shaft to said one end of said second arm;

a speed reduction gear for transmitting rotation of said motor to said shaft at a reduced speed;

said speed reduction gear being a harmonic speed reduction gear including a flex spline secured to said shaft, a circular spline secured to said first arm, and a wave generator operatively connected to said motor for engaging said flex spline with said circular spline at consecutive different circumferential positions during rotation of said wave generator, and

further comprising a sleeve supported for rotation relative to said first arm and about said shaft, said wave generator being secured to said sleeve, and a pulley secured to said sleeve and operatively connected to said motor for transmitting rotation of said motor to said wave generator of said speed reduction gear.

4,682,933

LABYRINTHINE TURBINE-ROTOR-BLADE TIP SEAL

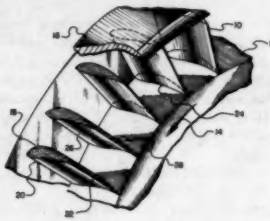
William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 661,950, Oct. 17, 1984, abandoned. This application May 14, 1986, Ser. No. 865,924

Int. Cl.[4] F01D *5/20*

U.S. Cl. 415—172 A **5 Claims**

1. A method for minimizing a fluid leakage flow rate across a rotor blade tip during operation of a rotor blade assembly having a casing, a rotor positioned within the casing, at least one rotor blade attached to the rotor, the rotor blade having a leading edge, a trailing edge, a tip including a tip surface spaced from the casing by a gap, a root portion, a pressure side and a suction side, a fluid flow across the blade tip from the pressure side to the suction side, the method comprising:



(i) determining a fluid flow relationship between a fluid leakage flow rate across the blade tip surface, a fluid leakage flow area on the tip surface, and the gap between the casing and the tip surface according to the formula

$$\frac{w}{A} = \frac{\sqrt{2gp\Delta P}}{\sqrt{C_1 N + C_2}} \quad (1)$$

where:

w=leakage flow rate,

A=leakage flow area between a shroud and a tip surface area (delta x chord fraction),

g=gravitational constant (32.2 ft. per sec.^{2}),

ΔP=chordwise pressure differential (suction to pressure side),

ρ=leakage fluid density,

C_1, C_2=flow constants for a given gap distance,

N=number of recesses on at a tip surface area,

(ii) deriving a number of recesses based on the derivative values of C_1 and C_2 of formula (1),

(iii) machining the recesses into the blade tip surface in conformity with formula

$$1 \leqq D/Z \leqq 3 \quad (a)$$

wherein D is the recess depth and Z is the recess width, and the formula

$$1 \leqq Z/\delta \leqq 30 \quad (b)$$

wherein δ is the gap value between the casing and the blade tip surface and Z is as above,

(iv) establishing suction vortices within each recess,

(v) diverting at least a portion of the fluid flowing from the pressure side to the suction side into each recess; and

(vi) minimizing the fluid flow across the blade tip surface.

4,682,934

WHEEL ANTI-ROTATION MEANS

Victor J. Knorowski, Rexford; Charles R. Hean, Clifton Park, and Ronald J. Placek, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1985, Ser. No. 806,072

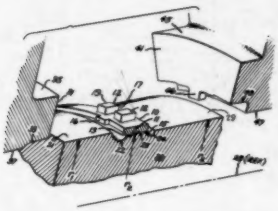
Int. Cl.[4] F01D *5/06*

U.S. Cl. 416—198 A **30 Claims**

1. In an axial fluid flow turbine, anti-rotation means for securing a wheel to be disposed about a first surface portion of a rotatable shaft of the turbine, said anti-rotation means for preventing rotation of the wheel with respect to the shaft, said anti-rotation means comprising:

locking means including an annular member surrounding said shaft, said locking means discrete from yet irrotatably affixed to a second surface portion of the shaft; and, wherein the second surface portion has a predetermined

axial expanse and further wherein said annular member includes a radially inner surface for irrotatably engaging the second surface portion, wherein the radially inner surface of the annular member axially extends beyond both axial ends of the second surface portion; and,



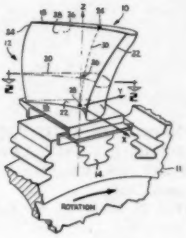
restraining means affixed to said locking means, said restraining means for fixedly engaging a portion of the wheel, whereby rotation of the wheel with respect to the shaft is prevented.

4,682,935

BOWED TURBINE BLADE

Jack R. Martin, Bedford, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Dec. 12, 1983, Ser. No. 560,718
Int. Cl.[4] F01D *5/12*
U.S. Cl. 416—223 A **9 Claims**



1. A blade for a gas turbine engine comprising an airfoil portion including a leading edge, a trailing edge, an intermediate section, and a non-linear stacking axis effective for introducing a compressive component of bending stress, exceeding a compressive yield strength of said blade, in said trailing edge and said leading edge of said intermediate section due to centrifugal force acting on said blade.

4,682,936

FUEL SUPPLYING PUMP

Ryozo Suzuki; Jun Shiraga; Shingo Iwai, and Tetuo Okashiro, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

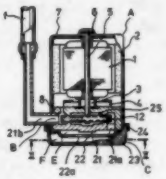
Filed Jan. 27, 1986, Ser. No. 823,098
Claims priority, application Japan, Jan. 29, 1985, 60-17096
Int. Cl.[4] F04B *21/08*
U.S. Cl. 417—366 **3 Claims**

1. A fuel supplying pump, to be disposed within a fuel tank on a bottom thereof to be driven by electric driving means, comprising

a pump casing having a center axis and a suction port, an end cover having a center axis and a suction port, and

a fuel filtration element disposed under said end cover with a gap F between said end cover and said fuel filtration element,

said suction port of said end cover and said suction port of said pump casing each being disposed on a radial line



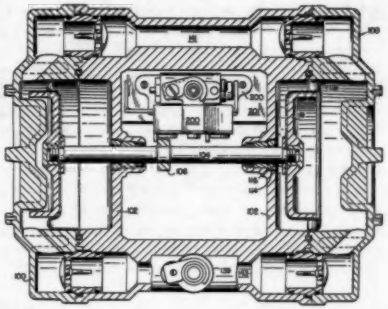
extending from said center axis at a position removed from said center axis, said radial lines being angularly separated.

4,682,937

DOUBLE-ACTING DIAPHRAGM PUMP AND REVERSING MECHANISM THEREFOR

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 574,310, Jan. 26, 1984, Pat. No. 4,634,350, which is a division of Ser. No. 320,584, Nov. 12, 1981, Pat. No. 4,436,493, which is a continuation-in-part of Ser. No. 77,544, Sep. 21, 1979, abandoned. This application Jan. 28, 1986, Ser. No. 823,216
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—393 **16 Claims**



1. A reciprocating pump and reversing mechanism therefor comprising in combination:

(a) a pump housing including a pair of laterally spaced-apart chambers each of which has a diaphragm member therein dividing each chamber into a driving section and a discharge section, each of said discharge sections having an inlet port and an outlet port and each of said driving sections having inlet-outlet port means;

(b) said diaphragm members being interconnected by a shaft mounted in said housing for reciprocating movement, whereby said shaft moves with said diaphragm members such that as the driving section of one chamber expands, forcing its discharge section to contract, the driving section of the other chamber contracts while its discharge section expands;

(c) protrusion means fixedly connected to said shaft and extending transversely therefrom for use in coupling the movement of said shaft to the movement of the below-recited valve actuating member;

(d) said housing also including a fluid outlet manifold interconnecting said outlet ports of said discharge sections, a fluid inlet manifold interconnecting said inlet ports of said discharge sections, and driving fluid manifold means for

feeding driving fluid to and from said inlet-outlet port means of said driving sections;

(e) inlet and outlet valves in said housing in fluid communication with said fluid inlet and outlet manifolds, respectively, for controlling the flow of fluid to be pumped to and from each of said discharge sections;

(f) control valve means including valve housing means for housing said control valve means, said valve housing means being connected to said pump housing and including reciprocable spool valve element means in said valve housing means and being in fluid communication with said driving fluid manifold means and being movable between two alternate positions for alternately directing driving fluid to one of said two driving sections, while also alternately allowing driving fluid to flow from the other one of said two driving sections, said spool valve element means having first contact surface means for being contacted by the below-recited valve actuating member;

(g) a valve actuating member mounted for reciprocating movement between two control valve-actuated end positions, said valve actuating member having second contact surface means positioned adjacent said first contact surface means of said spool valve element means for alternately snap contacting said first contact surface means to alternately snap said spool valve element means back and forth between its two positions, said valve actuating member also having third contact surface means for use in coupling the movement of said shaft to the movement of said valve actuating member, coupling means including said protrusion means and said third contact surface means for operatively coupling said protrusion means to said valve actuating means for alternately initiating each reciprocating stroke of said valve actuating member as said shaft reciprocates, the completion of each of said reciprocating strokes of said valve actuating member being carried out by the below-recited snap-acting means;

(h) snap-acting means, including at least one pin, a helicoidal compression spring at least partially surrounding said pin and a pin mounting element, for completing the movement of said valve actuating member from one of its two positions to the other initiated by said coupling means, said pin mounting element being pivotably secured for at least partial rotation about an axis stationary with respect to one of said valve actuating member and said housing, said pin being slidably mounted to said pin mounting element for sliding motion in a direction perpendicular to said axis; and

(i) wherein said pin mounting element is in the form of a tubular socket for receiving an end of said pin and at least a portion of said compression spring.

4,682,938

GEAR PUMP BEARINGS

R. Michael Riordan, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 26, 1985, Ser. No. 813,591

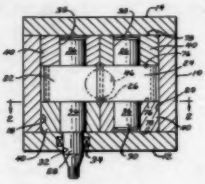
Int. Cl.[4] F04C *2/18*; B23P *13/04, 15/14*

U.S. Cl. 418—1 **7 Claims**

1. In a method of making a gear pump having a housing with an interior chamber defined by two intersecting cylindrical bores whose axes are parallel and which are to respectively receive (a) one of a pair of meshed gears, with each gear having an associated shaft, and (b) a cylindrical bearing for the associated shaft with the bearings for the shafts having facing and engaging flats adjacent the area at which the gears mesh, the steps of:

closely maintaining to a desired tolerance the distance between the flat of each bearing and the rotational axis for the shaft defined by the bearing; and

providing such reliefs only diametrically opposite said flats as may be required to fit said gears, bearings and shafts to



said chamber at the interfaces of said bores and said bearings remote from said flats.

4,682,939

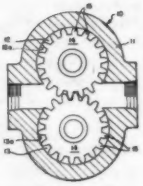
GEAR PUMP OR MOTOR WITH TOOTH TIPS OF DISSIMILAR METAL

John D. Petro, Hubbard, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Mar. 25, 1986, Ser. No. 843,675

Int. Cl.[4] F03C *2/08*; F04C *2/18*

U.S. Cl. 418—178 **9 Claims**



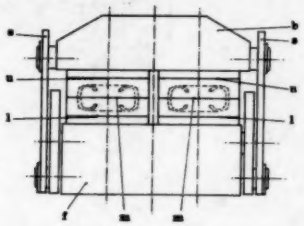
1. A gear pump or motor structure comprising a housing having a chamber, a pair of gears having intermeshing teeth running wiping contact with the chamber, said teeth having tips of a separate dissimilar harder metal from that of the gear teeth and the chamber surface with a non-smooth surface finish on said teeth tips whereby said chamber working surface is wiped to a smooth clean surface in operation.

4,682,940

DOUBLE-MOLDED VULCANIZING PRESS

Augusto Pizzorno, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy

Filed Dec. 20, 1985, Ser. No. 811,407
Claims priority, application Italy, Dec. 21, 1984, 24220 A/84
Int. Cl.[4] B29C *35/02*
U.S. Cl. 425—34 R 8 Claims



1. A molding and/or vulcanizing press that is provided with two adjacent sites for containing two corresponding vulcanizing molds, each mold comprising at least two opposite sections, a lower and an upper section respectively, that are reciprocally shiftable axially, defining a cavity inside which a product is molded and/or vulcanized, with each section being mounted on corresponding upper and lower tables, said press comprising a frame including a base, provided with two housing seats for said lower tables, a beam to which said upper tables are connected, two shoulders connecting said beam to said base through fixtures that allow for shifting of said beam with respect to said base for realizing at least the opening and shutting of said molds and for exercising a thrust upon each pair of opposed sections, sufficient for keeping said molds shut by contrasting the pressure acting inside said molds during each working cycle, and support means for coupling said molds to said press, said support means being respectively integral with said beam and said base and interposed between said beam and said upper table and between said base and said lower table, said support means being provided with coupling surfaces for coupling with corresponding matching surfaces provided on said tables, said upper and lower tables being mounted on said frame, freely shiftable with respect to said beam and base, said coupling surfaces of said support means being shaped so as to allow relative shifting of each closed and pressurized mold, with respect to said frame.

4,682,941

FLATTENING AND TAKE-OFF APPARATUS FOR PROVIDING A PLASTIC FILM WEB FROM A BLOWN TUBULAR FILM

Hartmut Upmeier, and Rudolf Peters, both of Lengerich, Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Jun. 10, 1986, Ser. No. 872,574
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 3520914
Int. Cl.[4] B29C *53/10*
U.S. Cl. 425—72 R 11 Claims

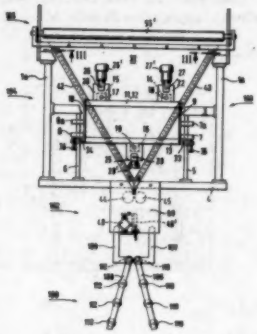
1. A flattening and take-off apparatus for a tubular plastic film extruded from a stationary film extrusion head, said apparatus comprising:

(a) flattening means positioned downstream of the film extrusion head for flattening a tubular film;

(b) a pair of rotatable pinch rolls positioned downstream of said flattening means and having their axes in parallel relationship for receiving flattened tubular film therebetween;

(c) cutting means positioned between said pinch rollers and said flattening means for longitudinally cutting said flattened film along one lateral edge thereof to define a pair of juxtaposed film portions connected at an opposite lateral edge of said flattened tubular film;

(d) unfolding means positioned downstream of said pinch rollers for receiving said cut flattened film and for progressively turning each of said juxtaposed film portions in opposite directions about said opposite lateral edge until the juxtaposed film portions are substantially coplanar to



provide a substantially flat web, said unfolding means including an edge contact member in contact with said opposite lateral edge of said film, and outwardly diverging elongated edge members about which respective ones of said juxtaposed film portions are adapted to pass; and

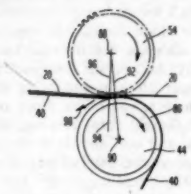
(e) adjusting means for adjusting the position of said unfolding means relative to the axis of said tubular film.

4,682,942

DRY FORMED-WEB EMBOSSING APPARATUS

Joel P. Gotchel, Glen Mills, Pa.; Henry J. Norton, Wilmington, Del.; Rudolf Neuenschwander, Swarthmore, and Daniel J. Stango, Newtown Square, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 12, 1985, Ser. No. 764,907
Int. Cl.[4] B29C *59/02*
U.S. Cl. 425—103 18 Claims



1. Apparatus for transferring and conveying a dry-formed nonwoven web through an embossing nip comprising:

(a) a stable, inelastic, porous endless belt having an upper surface for receiving and conveying the web;

(b) means for moistening the web while it is on the belt;

(c) a heated embossing roll;

(d) an anvil roll, located beneath the embossing roll, forming the embossing nip with the embossing roll, the embossing roll being mounted with respect to the anvil roll so that the web and the belt passes directly under the center of the embossing roll before passing directly over the center of the anvil roll;

(e) means for guiding the web and belt into the embossing nip so that the web and belt partially wraps the embossing roll before entering the embossing nip whereby air in the web is forced through the porous belt; and

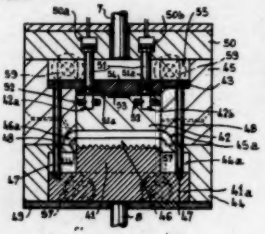
(f) means for driving the belt, embossing roll and an avil roll at a speed greater than 300 feet per minute.

4,682,943

INJECTION MOLDS FOR THE MANUFACTURE OF COMPOSITE BODIES

Jacques Schomblond, Montagnieu, France, assignor to Cartier Industrie, Thyez, France

Filed Mar. 20, 1986, Ser. No. 841,969
Claims priority, application France, Mar. 22, 1985, 85 04518
Int. Cl.[4] B29C 45/04
U.S. Cl. 425—130 12 Claims



1. An injection molding apparatus for making composite bodies comprising a mold having a generally hollow die element having upper and lower surfaces, a cover extending across said upper surface of said die element and a hollow punch means generally axially aligned with and engaging said lower surface of said die element so as to create an open laterally extending cavity therebetween, an upper, middle and lower block means movably mounted within said die element, connector means normally urging said middle block means into abutting relationship to said upper block means for concurrent movement therewith, means for simultaneously moving said upper and lower block means axially with respect to said die element and said punch means, means for selectively limiting the concurrent movement of said middle block means with said upper block means so as to space said middle block means from said upper block means to form a first cavity within said die element between said middle and lower block means which is closed from said open laterally extending cavity, first injection means for introducing a first plastic material into said first cavity, said means for selectively limiting the concurrent movement of said middle block means with said upper block means being selectively movable so as to urge said middle block means into engagement with said upper block means after said first material has been introduced into said first cavity, said means for simultaneously moving said upper and lower block means being shiftable so as to move said upper, middle and lower block means away from said cover means to thereby form a second cavity between the first plastic material and said middle block means and within said die element, said second cavity being in open communication with said laterally extending cavity, and means for injecting a second plastic material into said second cavity so as to interface with said first plastic material.

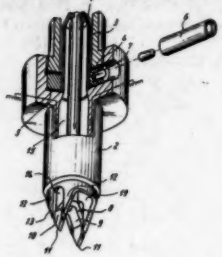
4,682,944

ELECTRICALLY HEATED INJECTION NOZZLE AT THE END OF A HOT RUNNER

Walter Muller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co. KG, Herford, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,477
Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417220
Int. Cl.[4] B29C 45/20
U.S. Cl. 425—549 14 Claims

1. In an electrically heated injection nozzle for a hot runner, having a central heating rod, an annular jacket component around the rod forming an annular channel through which injected plastic flows, wherein the heating rod extends through the center of the jacket component and terminates in an end portion which is received in a supply aperture of an associated mold cavity and wherein the end portion of the heating rod, which extends into the supply aperture, is part of an electric-resistance heating system, the improvement wherein: the end portion of the heating rod comprises a fork-shaped member having fork shanks with free ends terminating in points each of



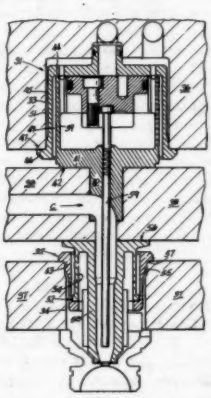
which extends at least into the vicinity of the supply apertures and wherein the jacket component has at least one jacket tongue for each shank jacket tongue terminating in a point and connected to one shank.

4,682,945

THERMAL INSULATING AND EXPANSION ASSEMBLY FOR INJECTION MOLDING MACHINE

Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Continuation-in-part of Ser. No. 630,970, Jul. 16, 1984, Pat. No. 4,588,367. This application Oct. 3, 1985, Ser. No. 783,580
Int. Cl.[4] B29F 1/03
U.S. Cl. 425—549 10 Claims



1. In a pressure molding machine having a floating manifold disposed between two spaced abutments, said manifold having at least one conduit communicating with and contacting a nozzle set in one of said abutments, means for sealing the manifold relative to said nozzle comprising:

thermal expansion manifold support assemblies disposed between the manifold and mating abutments, each thermal expansion assembly having a first expansion element in contact with said manifold and spaced from an adjacent abutment, and a second thermal expansion element in contact with a mating abutment, and spaced from said manifold, said second expansion element being a tubular body having a first flange extending radially outwardly from one end thereof and a second flange extending radially inwardly from an opposite end thereof, said first flange contacting said adjacent abutment at a first region of contact, said first expansion element having a pair of opposite ends and being seated in the second expansion

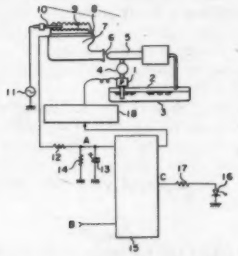
element with one end of the first element contacting the second flange at a second region of contact, and an opposite end of the first element being free of contact with said second expansion element, said opposite end of the first element being in contact with the manifold, whereby compressive stress in said elements resulting from thermal expansion is distributed to both elements thereby precluding the tendency of said elements to buckle or collapse under stress while minimizing the transfer of heat to said abutments.

4,682,946

CARBURETION TYPE BURNING APPARATUS

Toshio Kasada, Ojima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 783,106
Claims priority, application Japan, Oct. 11, 1984, 59-213139
Int. Cl.[4] F23N *5/26*
U.S. Cl. 431—14 **6 Claims**



1. A carburetion type burning apparatus having a carburetion chamber for evaporating liquid fuel which comprises a timer for counting time from the initiation of burning operation, an ion current detecting device positioned in the flames for measuring an ion current in the flames (if) at the time after a predetermined time counted by said timer in which the ion current in flames is stabilized, a judging device for judging existence or non-existence of an abnormal burning state by comparing the measured ion current (if) and a predetermined open threshold value of ion current which causes abnormal burning condition, a burning quantity controlling device for controlling the quantity of fuel to be burned in response to the output from said judging device and an alarming device for generating an alarm when said judging device provides judgment of abnormal condition.

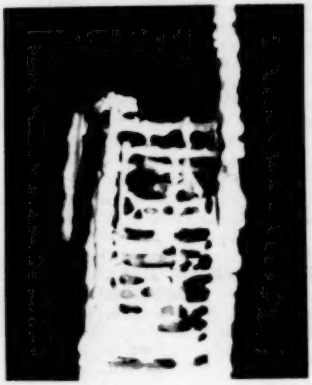
4,682,947

DECORATIVE CANDLES

Clement H. Luken, Jr., Highland Heights, and Donald V. Kinsman, Fort Thomas, both of Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 776,711, Sep. 16, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 893,423
Int. Cl.[4] F23D *3/16*
U.S. Cl. 431—288 **11 Claims**

1. A pillar candle which upon burning leaves a decorative and aesthetically pleasing free-standing shell having a filigree or lace-like pattern comprised of a flat cotton wick having from 27 to 45 plies and having a thickness in the range of 0.042–0.058 inches and width in the range of 0.079–0.118 inches and centrally located within a solid fuel cylinder and extending axially from the base and through the opposite end of said cylinder; said fuel cylinder having a diameter of 2 to 3½ inches with the ratio of wick size to candle diameter ranging from 12 to 19 plies per inch and comprised of a fatty acid



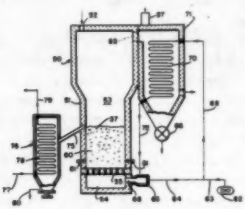
composition having a titer from 50° C. to 66° C. and wherein the predominant fatty acids are stearic acid and palmitic acid.

4,682,948

METHOD AND APPARATUS FOR PRODUCING CEMENT CLINKER INCLUDING WHITE CEMENT

Sidney M. Cohen, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.

Division of Ser. No. 655,820, Oct. 1, 1984, Pat. No. 4,595,416. This application Mar. 3, 1986, Ser. No. 835,664
Int. Cl.[4] F27B *15/00*; F22B *1/00*
U.S. Cl. 432—58 **2 Claims**



1. Apparatus for producing cement clinker comprising:

a feed preparation system including means for combining cement forming raw materials with carbon bearing material, a binder and water to form a mixture and for forming the mixture into nodules, means for drying the nodules and means for sizing the nodules;

a vessel having a gas permeable grid dividing the vessel into a lower plenum chamber and an upper material chamber;

means for supplying the sized nodules to the upper material chamber;

means for supplying air under pressure to said lower plenum chamber for passage upwardly through the gas permeable grid for establishing and maintaining a fluidized bed of nodules within the upper material chamber;

means for supplying additional fuel to the upper material chamber for combustion together with the carbon bearing material within the nodules for maintaining the fluidized bed at cement clinkering temperature;

said upper material chamber having an outlet for cement clinker and an outlet for spent combustion gas;

a heat exchanger flow connected to the outlet for cement clinker for cooling cement clinker discharged from the upper material chamber including means for supplying ambient air thereto for heat exchange with the cement clinker whereby the cement clinker is cooled and the ambient air is heated;

means for supplying the heated ambient air to the means for drying the nodules; and

a heat exchanger flow connected to the outlet for spent combustion gas of the vessel including means for supplying ambient air thereto for indirect heat exchange with the spent combustion gas whereby the spent combustion gas is cooled and the ambient air is heated and an outlet for heated ambient air flow connected to said means for supplying air to the lower plenun chamber;

said means for forming the mixture of cement forming raw material, carbon bearing material, water and a binder into nodules is an extruder and said means for drying the nodules is a tray dryer flow connected to the heat exchanger for cooling cement clinker.

4,682,949

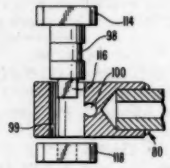
TOOL HOLDER FOR ULTRASONIC ENDODONTIC APPARATUS

George E. Warrin, North Merrick, N.Y., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Jul. 12, 1985, Ser. No. 754,175

Int. Cl.[4] A61C *5/02*

U.S. Cl. 433—81 **28 Claims**



1. An ultrasonic endodontic apparatus for use with an endodontic tool having a mounting shaft and a working surface comprising:

an ultrasonic dental handpiece adapted to deliver vibratory energy and a flow of irrigation fluid,

a tool support assembly adapted to be connected to said handpiece and having a tool mounting head adapted to receive said vibratory energy and said flow of irrigation fluid from said handpiece,

said head including a tool mounting bore therein adapted to receive the mounting shaft of the endodontic tool,

an eccentric cam positioned generally in said head for tightly clamping the mounting shaft of the endodontic tool in said head,

said eccentric cam being adapted to move the mounting shaft in said tool mounting bore so that the mounting shaft is inserted further into said tool mounting bore as said eccentric cam is tightened in a given direction,

said eccentric cam terminating in a flange at each end thereof,

said flanges being adapted to rotate said eccentric cam to thereby clamp the tool in said head, and

a wrench adapted to engage both of said flanges and to pivot about said head while engaged therewith to thereby clamp the tool in said head.

4,682,950

DEVICE AND METHOD OF BONDING AND VENEERING DENTAL MATERIAL TO A TOOTH

William B. Dragan, 85 Burr St., Easton, Conn. 06612

Filed Oct. 30, 1985, Ser. No. 792,803

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—90 **10 Claims**

1. A disposable dental syringe tip for packaging, dispensing and applying a dental tooth veneering material directly to a tooth comprising

a plastic disposable nozzle having a generally cylindrical body portion defining a reservoir adapted to receive a predetermined amount of dental veneering material;

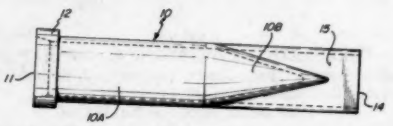
a discharging tip portion terminating in a discharge orifice,

said body portion having a full open end opposite said discharge orifice,

a laterally extending external flange circumscribing said full open end,

said cylindrical body portion converging toward said discharge orifice to define a conically shaped intermediate portion disposed between said cylindrical body portion and said discharge orifice, said conically shaped intermediate portion being axially disposed relative to said cylindrical body portion,

said discharging tip portion defining a generally flat and broad rectangularly shaped discharge orifice.



a piston disposed in said body portion for sealing said full open end,

said piston being displaceably disposed in said body portion,

said piston having a wiper portion for engaging the interior surface of said cylindrical body portion, and

said piston having a conically shaped tip end adapted to compliment the intermediate conically shaped portion of said nozzle tip.

said piston being slidably disposed within said body portion for ejecting the dental material therefrom when displaced, whereby substantially all of the material disposed in said nozzle tip can be expressed therefrom when said piston has been fully displaced within said cylindrical body portion.

4,682,951

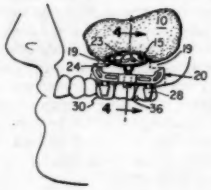
ADJUSTABLE SINUS LIFT IMPLANT

Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed May 28, 1986, Ser. No. 868,121

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 **22 Claims**



1. An oral implant for implanting an artifical tooth supporting structure in an opening created entirely within an edentulous span of the dental arch of the maxilla of a patient, such that the opening leaves sufficient bone to support said implant prior to being put in operation, comprising:

a basket-like container portion open at one side, said container portion having a size such that it can be passed easily into the opening;

a base portion having a size such that it can be wedged tightly in a portion of the opening in the bone; and

adjusting means for adjusting the distance between said container portion and base portion.

4,682,952

TRAINING DEVICE

Allyn J. Forsman, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

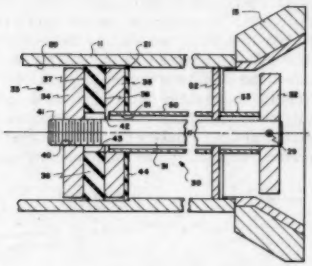
Filed Sep. 27, 1985, Ser. No. 780,776

Int. Cl.[4] G09B *9/00*; **F41F** *27/00*

U.S. Cl. 434—12 **5 Claims**

1. A launcher having a bore to receive a predetermined projectile at a predetermined site therein, to exhibit as a loaded

weapon a predetermined weight and center of gravity; and an accessory securable in said launcher in place of said projectile to give the launcher the same weight and center of gravity as



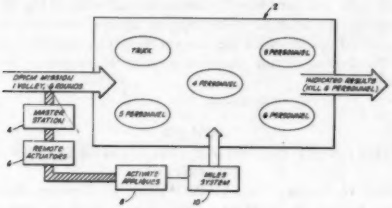
one loaded with a projectile, in which said accessory comprises means expandable to grip the inner wall of said launcher for securement therein.

4,682,953

COMBINED ARMS EFFECTIVENESS SIMULATION SYSTEM

Stephen Doerfel, Meers; Anthony G. Pokorny, and Howard H. Rubin, both of Lawton, all of Okla., assignors to L B & M Associates, Inc., Lawton, Okla.

Filed Jul. 9, 1985, Ser. No. 753,668
Int. Cl.[4] F41G *1/00*
U.S. Cl. 434—16 **22 Claims**



1. A battlefield simulator system for simulating the effect of firing a munition at a preselected target area, comprising:

master station means for transmitting, to remote actuators, first control signals in response to selection of a particular type of simulated munition and in response to selection of the target area, wherein said master station means is operable away from said munition and wherein said remote actuators are remotely located from said master station means at a plurality of spaced locations;

each respective one of said remote actuators including means for receiving said first control signals transmitted by said master station means and for determining if the respective remote actuator has been actuated in response to said first control signals, and means for transmitting, in response to selection of the respective remote actuator, second control signals to indicators mounted on battlefield targets; and

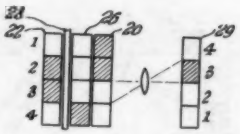
wherein each of said indicators includes means for receiving said second control signals from a plurality of said remote actuators and for determining from a preassigned probability whether the respective target to which the respective indicator has been mounted is disabled by the simulated munition.

4,682,954

CRYPTOGRAPHIC PROCESS AND ENCIPHERED PRODUCT

Richard C. Cook, U.S. Composite Service Group, APO 331, San Francisco, Calif.

Filed Oct. 24, 1960, Ser. No. 64,651
Int. Cl.[4] G09C *5/00, 1/00*
U.S. Cl. 380—154 **4 Claims**



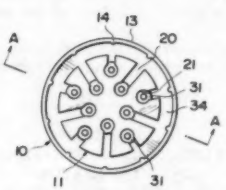
1. A cryptographic process for enciphering a text sheet having pictorial intelligence thereon in the form of opaque and transparent areas comprising the steps of placing a key sheet having random alternate opaque and transparent areas in registered relation to said text, exposing a sheet of film to light passed through the key and text sheets to produce a negative having opaque areas where both the key and text sheets are transparent and transparent areas where either the key or text is opaque, placing said negative in registered relation to said text and to a second film, exposing said second film to light passed through the negative and the key to expose the second film in areas where both the key and negative are transparent, placing the text in registering relation to the negative and to said second film, exposing said second film to light passed through the negative and text to expose the second film in areas where both the text and negative are transparent, and developing the second film to produce an image which is of one character in areas where said second film has been exposed and another character in areas where said second film has not been exposed.

4,682,955

EDUCATIONAL TOY

Yoshiomi Wada, 3-53-10, Higashi Oizumi-machi, Nerima-ku, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 791,783
Claims priority, application Japan, Oct. 31, 1984, 59-227642
Int. Cl.[4] G09B *1/14, 19/02*
U.S. Cl. 434—191 **9 Claims**



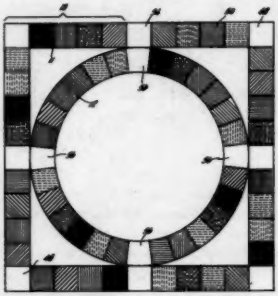
1. An educational toy comprising a body having a peripheral vertical wall, a guide plate secured on said body and having a plurality of cutouts to be passages, a connecting passage formed between said vertical wall and said guide plate for communicating with said cutouts, a spacer disposed between said guide plate and said body, a plurality of slider pieces slidably and undetachably movable along said cutouts and said connecting passage and a plurality of inwardly extending lugs formed inside the peripheral vertical wall of the body to prevent detachment of said slider pieces.

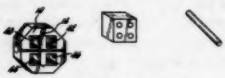
4,682,956

APPARATUS AND METHOD FOR LEARNING ABOUT THE RELATIONSHIPS AND PERSONALITIES OF A GROUP OF TWO OR MORE PERSONS

Leonard Krane, 1855 Sunset Plaza Dr., Los Angeles, Calif. 90069

Filed Nov. 27, 1985, Ser. No. 802,778
Int. Cl.[4] G09B *19/00*; A63F *3/00*
U.S. Cl. 434—237 **20 Claims**





1. A method for learning about the relationships and personalities of a group of two or more persons, comprising:

chosing a first person and a second person from the group of persons;

allowing the first person to select which of the first and second persons is to be a participant;

selecting a plurality of questions from among a set of pluralities of questions at least in part according to a color personality as revealed by a sequential selection of a plurality of colors and selection by the first person of physical indicia that match or relate to the first person's color personality, the plurality of questions being directly identified with the physical indicia selected by the first person;

selecting one of the plurality of questions to be answered, the selection being related to a color personality or preference of the participant;

if the participant is the first person, recording a secret answer of the second person to the selected question whereas if the participant is the second person, recording the secret answer of the first person to the selected question;

revealing the answer of the participant; and

comparing the answer of the participant with the secret answer.

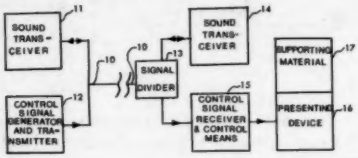
4,682,957

TELECONFERENCING AND TEACHING METHOD AND APPARATUS

Gordon W. Young, P.O. Box 8551, Salt Lake City, Utah 84108

Filed Feb. 24, 1986, Ser. No. 832,358
Int. Cl.[4] G09B *5/10*
U.S. Cl. 434—307 **20 Claims**

1. A teleconferencing and teaching system, enabling the live presentation of a program with supporting material from an originating location to at least one remote location being connected to the originating location by standard voice grade telephone service, comprising a device for presenting supporting material for the presentation located at the at least one remote location; a package of supporting material for the presentation prepared and supplied in advance of the presentation to the at least one remote location and adapted to be presented by said presenting device; means at the originating location for producing signals representative of the audio presentation made at the originating location and for transmitting such signals by a single line of the standard telephone service to the at least one remote location; means at the originating location for producing control signals representative of the desired operation of the presenting device and for transmitting such signals during the presentation by the same single line of the standard telephone service to the at least one remote location; means at the at least one remote location for receiving the signals from the single telephone line; means in series with the means for receiving signals from the telephone line for decoding the control signals and for determining when control signals are present; amplifier means for amplyifing signals fed



to it; delay means electrically in parallel with the decoding means and in series with the amplifying means to delay the signals through the delay means a period of time at least equal to the time required for the decoding means to determine when a control signal is present; blocking means electrically in series between the delay means and the amplifier means and operative in response to a determination by the decoding means that a control signal is present to block transmission of the control signal to the amplifier means; speaker means for converting signals from the amplifier means to audio sound that can be heard at such at least one remote location; means at the at least one remote location for receiving the signals representative of the desired operation of the presenting device and for operating the device during the presentation in response to said signals.

4,682,958

DATA ENTRY TERMINAL AND MEMORY MODULE THEREFOR

William H. Slavik, Palos Hills; William P. Carlson, Hanover Pk.; George L. Cepynsky, Woodridge; Paul G. Dussault, Barrington; Steven E. Margison, Downers Grove, and James A. Wolf, Jr., Deerfield, all of Ill., assignors to Nuvatec, Inc., Downers Grove, Ill.

Filed Jan. 30, 1985, Ser. No. 696,571
Int. Cl.[4] G09B *7/00*
U.S. Cl. 434—335 **8 Claims**

1. A portable data entry terminal for storing a plurality of user generated responses, said terminal comprising:

a keyboard comprising means for generating keyboard entries in response to user activation of the keyboard;

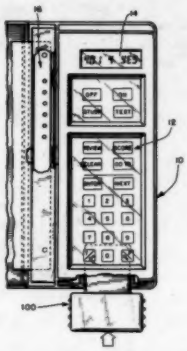
a display;

a computer responsive to the keyboard entries and coupled to drive the display;

a removable, portable read/write memory module readily connected to and removed from the computer, said memory module comprising both means for storing information indicative of a selected format for a set of questions, and means for storing a plurality of user responses to the set of questions;

means, included in the computer and responsive to the stored information, for configuring the keyboard for the format of the set of questions, said configuring means comprising means for disabling selected keyboard entries in response to the stored information to enforce user compliance with the selected format;

means, included in the computer, for storing the user responses to the set of questions in the memory module; and



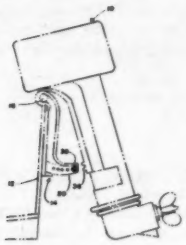
means, included in the computer, for storing a selected code in the memory module when the memory module has been used to store at least one of the user answers in order to indicate that the memory module has been used.

4,682,959

FINE TRIM ADJUSTMENT FOR MANUALLY TILTED OUTBOARD MOTOR

Howard S. MacGregor, 19 Glendale Dr., Kissimmee, Fla. 32741

Filed Oct. 28, 1985, Ser. No. 792,103
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—53 **10 Claims**



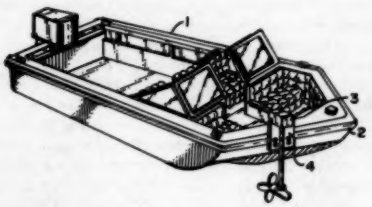
1. A mounting bracket arrangement for boat powered by an outboard motor having an elongate shaft housing, such that very slight increases in the tilt angle of the motor are made possible, said arrangement comprising a transom bracket means adapted to be mounted on the transom of a boat, said transom bracket means including a pair of stern brackets mounted in equally spaced relation on the transom of a boat, with the lower portions of said stern brackets each containing a spaced series of trim adjustment holes, with each hole in one of said stern brackets being in alignment with a corresponding hole in the other of said stern brackets, an elongate pin adapted to extend through any selected, aligned pair of spaced holes in said stern brackets, with a portion of the shaft housing of the outboard motor defining a saddle member designed to contact a portion of said elongate pin at a location between the inner walls of said stern brackets, with said elongate pin withstanding a substantial part of the forward thrust applied by said saddle member when the outboard motor is delivering power, the boater being able to apply fine grain corrective forces for trimming the boat when the boat is at rest by placing a sleeve of preascertained wall thickness over said pin, said sleeve only slightly increasing the effective diameter of the elongate pin, and thus only slightly increasing the distance between the center of said elongate pin and said saddle member, thereby only slightly increasing the tilt angle of the motor with respect to the transom of the boat, and resulting in improved performance and improved handling of the boat at selected speeds after the correct sleeve of proper thickness is fitted.

4,682,960

TROLLING MOTOR MOUNT

Gregory L. Hendrickson, 607 N. Second St., Mankato, Minn. 56001

Filed Sep. 12, 1985, Ser. No. 775,502
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—53 **3 Claims**



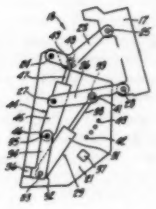
1. An apparatus for attaching a motor to a boat, comprising:
(a) a mounting plate perforated by at least two vertical slots;
(b) an external threaded cylinder having a first end and a second end, wherein the interior of the cylinder contains a longitudinal bore having a first diameter adjacent to the first end of the cylinder and having a second diameter adjacent to the second end of the cylinder, the first diameter being smaller than the second diameter such that the transition between the first diameter and the second diameter forms a bearing surface within the cylinder;
(c) a cap inserted into the second end of the cylinder such that a cavity is formed within the cylinder between the cap and the bearing surface;
(d) a shaft passing through each of the vertical slots of the mounting plate, the shaft being slidably mounted within the cylinder, the shaft having a first end formed as a head and having a second end formed as a thrust block, the thrust block residing within the cavity;
(e) a spring mounted within the cavity, such that the spring exerts an expansive force against the thrust block, thereby biasing the head of the shaft toward the cylinder.

4,682,961

TILT DEVICE FOR BOAT PROPULSION MACHINE

Ryoji Nakahama, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 22, 1985, Ser. No. 715,165
Claims priority, application Japan, Mar. 26, 1984, 59-56268
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **25 Claims**



1. A hydraulic tilt and trim arrangement for a marine out-

board drive having a housing carrying propulsion means and a base adapted to be affixed to the transom of an associated watercraft or the like, means supporting said housing from said base for movement of said housing relative to said base from a tilted, trimmed down position through a tilted down, trim up position and to a tilted, trimmed up position, a trim fluid motor having an operative pivotal connection at one end to said base and an operative pivotal connection at its other end to said housing, said trim fluid motor being operable through a stroke of a first length for moving said housing relative to said base from said tilted, trim down position to any of a plurality of tilted down, trim up trim positions, a tilt fluid motor having an operative pivotal connection at one end thereof to said base and an operative pivotal connection at the other end thereof to said housing, said tilt fluid motor being operable through a first stroke portion for applying fluid pressure to said base and said housing for effecting trim pivotal movement of said housing relative to said base, means for pressurizing said trim fluid motor and said tilt cylinder motor for actuating said trim fluid motor and said tilt fluid motor so that said trim fluid motor and said tilt fluid motor act in parallel relation to effect movement of said housing relative to said base through the full range of trim positions, said tilt fluid motor having a total operative stroker greater than said first stroke portion for effecting movement of said housing relative to said base from said tilted down, trimmed up position to said tilted, trimmed up position upon continued movement thereof, and means associated with said trim fluid motor for permitting movement of said housing and said base relative to each other for movement of said housing to said tilted, trimmed up position without restriction from said trim fluid motor.

4,682,962

METHOD OF MANUFACTURING A CATHODE RAY TUBE

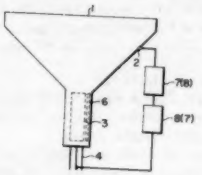
Katsuhiko Hata; Hisao Ohashi; Keiji Honda, and Takahiko Yamakami, all of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 657,124, Oct. 3, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 886,958

Claims priority, application Japan, Oct. 7, 1983, 58-188857

Int. Cl.[4] H01J *9/44*

U.S. Cl. 445—5 **2 Claims**



1. A method of performing a knocking treatment to a cathode ray tube having low and high voltage electrodes comprising a first step of applying an alternating voltage between said low and high voltage electrodes and a third step of applying a superimposed voltage comprising a high direct current voltage and an alternating voltage to said low and high voltage electrodes with the positive potential of said superimposed voltage being connected to said high voltage electrodes and wherein said alternating voltage is a half wave rectified voltage, the high value of said superimposed voltage is in the range of 50 to 70 kilovolts and the ratio of the alternating to the direct voltage is in the range of 4:1 to 0.5:1, and a second step of applying a direct current voltage between said low and high voltage electrodes which occurs between said first and third or said third and first step.

4,682,963

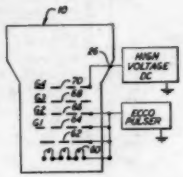
HIGH VOLTAGE PROCESSING OF CRT MOUNTS

Kenneth J. Daldry; Martin Fischman, and Charles H. Rehkopf, all of Seneca Falls, N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Mar. 20, 1985, Ser. No. 713,939

Int. Cl.[4] H01J *9/00*

U.S. Cl. 445—5 **9 Claims**



1. A method for high voltage conditioning the mount of a cathode ray tube, the mount comprising a plurality of elements including at least one thermionic cathode and associated heater for emitting a stream of electrons, and a series of electrodes for forming and focusing such electrons into a beam, the electrodes including an anode, at least one focusing electrode adjacent to and rearward of the anode, and at least one electrode rearward of and adjacent to the focusing electrode, the method comprising:

impressing a positive high voltage DC potential on the anode, while at the same time impressing a high frequency pulsed AC potential on at least the electrode rearward of the focusing electrode, and allowing the focusing electrode to float electrically, the voltage of the AC potential being less than that of the DC potential by an amount sufficient to induce arcing in the gaps between the anode and the focusing electrode, and between the focusing electrode and the adjacent rearward electrode.

4,682,964

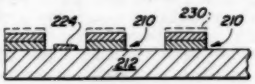
IONIZATION DETECTOR

Douglas S. Steele, Fairfield; Francis H. Little, Cincinnati; Joseph J. Sostarich, Fairfield, and Douglas E. Ingram, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 565,671, Dec. 27, 1983, Pat. No. 4,570,071. This application Feb. 25, 1986, Ser. No. 832,980

Int. Cl.[4] G01T *1/18*

U.S. Cl. 445—28 **2 Claims**



1. A method for improving signal response of a linear array radiation detector, the detector comprising an insulative substrate supporting a plurality of elongated closely spaced conductive strips, each of the strips serving as a detector element, the method comprising the steps of:

blowing clean, moisture-free air over the detector elements at a velocity sufficient to dislodge entrapped particles and contaminants;

heating the detector elements and insulative substrate to evaporate moisture on the detector; and

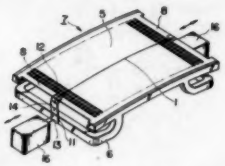
coating the detector elements and substrate with an electrically neutral moisture resistant material.

4,682,965

METHOD FOR MANUFACTURING AN ELECTRON BEAM SELECTION ELECTRODE

Hisao Kume, Aichi; Tokihiro Nishihara, Chiba, both of Japan; Hiroharu Shirasaka, San Diego, Calif.; Kenichi Kanehira, Tokyo, and Koji Saita, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 678,038
Claims priority, application Japan, Dec. 8, 1983, 58-232064
Int. Cl.[4] H01J 9/16
U.S. Cl. 445—37 6 Claims



1. A method for manufacturing an electron beam selection electrode for a color cathode ray tube, said electrode having a pair of spaced arm members, a plurality of grid elements respectively attached to and extending between said arm members, a pair of spaced end members parallel to said grid elements also extending between said arm members, a pair of support elements respectively disposed below and spaced from each end member, and a damper wire, said method comprising the steps of:

arranging a damper wire of predetermined length between a pair of spaced fixing members with opposite ends of said damper wire extending over a first end of each of said fixing members;

covering each opposite end of said damper wire and each first end of said fixing members with respective thin film tapes;

welding each of said ends of said damper wire and said thin film tapes respectively to said first ends of said fixing elements to provide a damper assembly;

arranging the wire of said damper assembly over said grid elements by engaging a portion of said first ends of said fixing elements respectively with said end members and with a second opposite end of each of said fixing members extending downwardly to one of said support members;

rigidly attaching said second ends of said fixing members respectively to said support elements; and

disengaging the first ends of said fixing elements from said respective end members thereby tensioning said damper wire across said grid elements to suppress mechanical vibration of said grid elements.

4,682,966

BALANCING FIGURE TOY BUILDING BLOCKS

Neil Kagan, 3412 Cypress Dr., Falls Church, Va. 22042

Filed Sep. 19, 1986, Ser. No. 909,330
Int. Cl.[4] A63H 33/00
U.S. Cl. 446—101 22 Claims

1. A toy figure block comprising a profile having distinct arms, legs, head and torso portions, said figure having sufficient thickness that it will stand in a variety of orientations on its arms, legs, head or combinations thereof, said figure having an imaginary central plane passing front-to-back through its

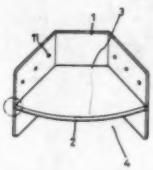
head and torso, with the center of gravity of said figure lying to one arm/leg side of said central plane.

4,682,967

MULTI-PURPOSE BUILDING BLOCK

Ching-Ho Kao, Fl. 7-2, No. 11, Yung Fu Road, Tainan, Taiwan

Filed Sep. 13, 1985, Ser. No. 775,743
Int. Cl.[4] H63H 63/06
U.S. Cl. 446—113 3 Claims



1. A multi-purpose building block unit for a building block set wherein each block unit comprises:

(a) a generally vertically extending supporting partition wall defining a pair of opposite distal edges, the supporting partition wall defining a concave shape having an open side and comprising a generally planar base segment and two generally planar side segments extending from opposite sides of the base segment, the side segments forming an angle of 60° to 90° therebetween;

(b) a generally horizontally extending partition plate attached to the supporting partition wall and extending across the concave shape so as to divide the block unit into upper and lower compartments, the partition plate defining a single, continuous edge extending between the distal edges of the supporting partition wall; and

(c) at least one row of holes defined by the supporting partition wall in the upper compartment, the holes adapted to engage fastening means to fasten a plurality of the block units together to form a multiplicity of combinations.

4,682,968

FIGURE TOY WITH RAPIDLY RETRACTABLE TRAP ELEMENT

Richard Droller, Prospect, and Richard I. Farrington, New Britain, both of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 21, 1986, Ser. No. 832,812
Int. Cl.[4] A63H 3/00
U.S. Cl. 446—268 18 Claims

1. A toy having a manually extensible and retractable element, comprising:

a body with an internal cavity having two spaced passages thereinto;

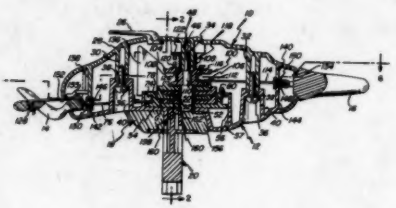
a spool assembly contained within said body cavity and

comprised of a plurality of components including a first, relatively large diameter spool and a second, relatively small diameter spool, said spools being mounted for rotation about a common axis and each having an engagement element thereon, said engagement elements being configured and disposed for operative interengagement in first and second rotatably displaced relationships so as to prevent relative rotation of said spools therebeyond in both directions, and to permit substantially free relative rotation thereof through an arc between the points of interengagement;

a first flexible line having an inner end portion wound upon said first spool, and having an outer end portion extending through one of said passages outwardly of said body;

a second flexible line having an inner end portion wound upon said second spool in the direction opposite to the direction of winding of said first line inner end portion, and having an outer end portion extending outwardly of said body through the other of said passages, the effective length of said inner end portion of said second line being lesser than that of said first line; and

a biasing member operatively connected between said body and said second spool, rotation of said second spool, by



extension of said second line to unwind said inner end portion thereof, energizing said biasing member so as to cause it to exert an opposite rotational force upon said second spool;

whereby, with said engagement elements of said spools operatively interengaged in said first relationship, and with said inner end portion of said first line so wound that unwinding thereof will cause said first spool to rotate in one direction with said elements moving toward said second relationship, said first line can be extended from said body to cause said first spool to rotate in said one direction and relative to said second spool through said arc and into said second relationship of said elements, with said second spool remaining substantially stationary, and whereby said second line can thereafter be extended from said body to rotate said second spool and, through interengagement of said elements, said first spool in the direction opposite to said one direction, to thereby rewind said first line inner end portion upon said first spool, such extension of said second line also energizing said biasing member and conditioning said member to rewind said inner end portion of said second line upon said second spool and to return said second spool to its position in said first and second relationships.

4,682,969

RECONFIGURABLE VEHICLE-ROBOT TOY

Terrence A. Choy, Redondo Beach, and Harold A. Hartleben, Boyle Heights, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

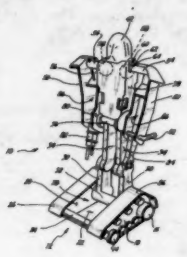
Filed Sep. 27, 1985, Ser. No. 781,607
Int. Cl.[4] A63H *13/00, 17/21*
U.S. Cl. 446—279 **12 Claims**

1. A toy comprising:

a base member having two sides and a bottom forming a compartment;

lower leg members each having one end thereof rotatably coupled to one of said two sides;

upper leg members each having one end thereof rotatably coupled to the other end of one of said lower leg members, said lower and upper leg members capable of being rotated and moved to a position within said compartment;



a torso member simulating a robotic humanoid head and trunk rotatably coupled to the other end of each of said upper leg members; and

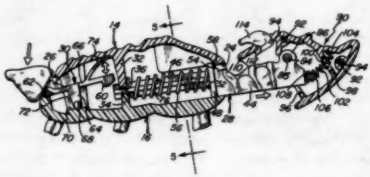
side arm means operably coupled to said torso member for selective simulating a pair of arms for said robotic humanoid head and trunk and a front end of a vehicle.

4,682,970

FIGURE TOY WITH EXTENSIBLE HEAD PORTION

Craig Dubois, Granby, Conn., and Brian Fontaine, Southbridge, Mass., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 6, 1986, Ser. No. 826,845
Int. Cl.[4] A63H *3/36*
U.S. Cl. 446—309 **10 Claims**



1. A toy figure having an extensible and thrusting head, comprising:

a generally hollow body having forward and rearward end portions;

a neck member mounted within said body for sliding movement between first and second positions substantially along a first axis between said end portions thereof, said neck member having an outer portion which protrudes from said forward end portion of said body in said first position of said member, and which projects further outwardly in said second position thereof;

a head member mounted upon said outer portion of said neck member for pivotal movement about a second axis, which is generally transverse to said first axis, between first and second positions, said head member having a constraining element thereon which contacts said body in said first position of said neck member to constrain said head member to said first position thereof, and which is spaced from said body in said second position of said neck member to free said head member from such constraint;

means for biasing said head and neck members toward said respective second positions thereof;

latch means for retaining said neck member in said first

position and operable to release said neck member for extension to said second position thereof; and

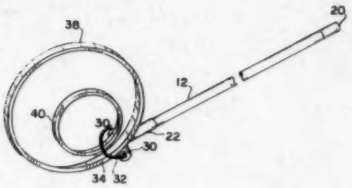
means for providing access externally of said body for effecting release of said latch means; whereby, upon release of said latch means said neck member and said head member will be extended and thrust, respectively, from said first to said second positions thereof by said biasing means.

4,682,971

STICK AND HOOP TOY

Leo Washington, 2612 Grenada Cir. West, St. Petersburg, Fla. 33712

Filed May 27, 1986, Ser. No. 866,930
Int. Cl.[4] A63H *33/02*
U.S. Cl. 446—450 **1 Claim**



1. A hoop toy of the type including a single handle, plural hoops, and means for preventing the hoops from rolling away from the handle, comprising:

a single, elongate handle member;

a single, "D"-shaped hoop-retaining yoke member secured to a distal end of said handle member;

plural hoop members of differing diameters being positioned within the confines of said yoke member;

said hoop members being independently formed with respect to each other and thus being substantially nonengageable with each other;

said yoke member having a straight portion positioned rearwardly of said plural hoop members so that said plural hoop members at any given time will have portions thereof slideably engaged by said straight portion simultaneously when said toy is in operation;

said yoke member having a curved portion positioned forwardly of said portions of said plural hoop members to retain said hoop members within the confines of said yoke member;

said plural hoop members being positioned in lateral relation to one another when the toy is in operation;

and a specific later relationship of the plural hoops with respect to one another being changeable by the operator of the toy by manipulation of said handle member when said hoop members are rolling in a uniform direction.

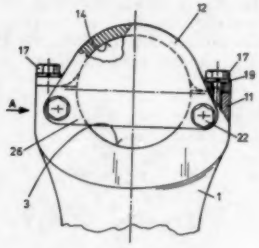
4,682,972

COVER PLATE FOR UNIVERSAL JOINT ASSEMBLY

Armin Olschewski, Schweinfurt, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,821
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447275
Int. Cl.[4] F16D *3/26, 3/40*
U.S. Cl. 464—130 **1 Claim**

1. In a universal joint assembly consisting of a cross piece (2) having at least one pin (7) supported in a bearing bushing (5), the bearing bushing having a bottom section (6) and an adjacent adjacent sleeve section (4); a fork having a least one fork arm (1) extending therefrom and terminating in an edge section (11), the edge section having a recess (3) machined therein which receives the bearing bushing and support surfaces (13) disposed on opposite sides of the recess; a cover plate (12) removably attached to the fork arm to support and hold the bearing bushing in the recess, the cover plate comprising a strap (20) having flange sections (15) connected to the support surfaces by means of screw fasteners (17), an elongated mounting section (25) extending across the bottom section of the bearing bushing and having a terminal section (25*a*) connected



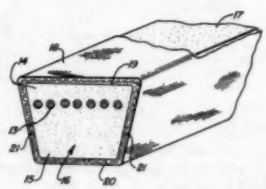
to the fork arm by means of a screw fastener (33), and a pair of leaf spring sections (34) disposed on opposite sides of the mounting section and having a shorter length than the mounting section, the leaf spring sections press elastically inwardly against the bottom section of the bearing bushing with a predetermined pretension in the longitudinal direction.

4,682,973

V-BELT FOR HIGH LOAD POWER TRANSMISSION

Kunihiro Fujita, Nishinomiya, and Hideaki Tanaka, Kobe, both of Japan, assignors to Mitsuboshi Belting Ltd., Nagata, Japan

Filed Mar. 21, 1986, Ser. No. 842,152
Int. Cl.[4] B65G *15/34*
U.S. Cl. 474—263 **13 Claims**



1. In a power transmission V-belt for transmitting a high load, said V-belt comprising a belt body having an inner compression section and an outer tension section, and longitudinally extending tensile elements embedded in said V-belt between said sections, the improvement comprising

the portion of said V-belt in which said tensile elements are embedded comprising hard rubber having short reinforcing fibers distributed therein and oriented longitudinally of the V-belt and present in the ratio of less than 5 parts to 100 parts of rubber by weight.

4,682,974

SLIP CASE PACKAGE

Robert J. Sun, 1409 Ferry St., Easton, Pa. 18042

Filed May 20, 1985, Ser. No. 735,834
Int. Cl.[4] B31B *1/88*
U.S. Cl. 493—55 **4 Claims**

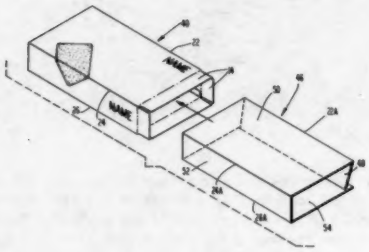
1. A method of making a slip case package for containing small articles, said package including a sleeve member and a drawer being slideably received therein, said method comprising:

providing a blank of relatively lightweight cardboard hav-

ing a body portion with a plurality of end flaps projecting therefrom, said blank having graphic designs formed thereon;

forming said blank into a partially assembled sleeve member, said body portion of said blank defining a central cavity in said partially assembled sleeve member, said partially assembled sleeve member having at least one open end with said plurality of end flaps associated with said at least one open end projecting from said open end

providing a reinforcing member having the shape of said central cavity and sized to fit within said central cavity;



inserting said reinforcing member within said central cavity through said at least one open end;

securing said reinforcing member within said central cavity by folding said end flaps into said cavity at said open end over an end of said reinforcing member in order to complete the assembly of said sleeve member;

providing a drawer dimensioned to fit within said cavity; and

slideably engaging said drawer within said sleeve member.

4,682,975

MACHINE AND METHOD FOR SETTING-UP BASKET STYLE ARTICLE CARRIERS

Johannes A. Heijnen, Bergen Op Zoom, Netherlands, assignor to The Mead Corporation, Dayton, Ohio

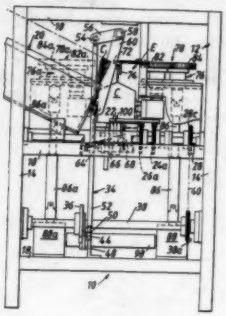
Filed Apr. 28, 1986, Ser. No. 856,890

Claims priority, application United Kingdom, Apr. 27, 1985, 8510755

Int. Cl.[4] B31B *1/12, 1/78*

U.S. Cl. 493—123 **4 Claims**

1. A machine for erecting collapsed basket style article carriers of the type having opposed side-and end walls, medial longitudinal partitions and a base panel to be engaged with retaining elements provided adjacent both end walls so as to maintain the carrier in erected condition, which machine comprises means for withdrawing from a supply and depositing the carriers in flat collapsed condition one after the other in a feed path, means for feeding each carrier to an erecting station at which means are provided for moving apart opposing side walls of the carrier to bring it into set-up condition, locking means operable to sequentially move said base panel into engagement with the retaining elements at the trailing and leading end of the carrier, said locking means comprising a main locking arm movable in a direction opposite to the feed direction of the carrier and effective to move the trailing end of said base panel into engagement with the retaining element at the trailing end of the carrier, a secondary locking arm arranged to subsequently move the leading end of said base panel into a position in which it can move into engagement with the retaining element at the leading end of the carrier, said secondary locking arm being mounted for pivotal movement relative to



said main locking arm and in the same general direction as the main locking arm.

4,682,976

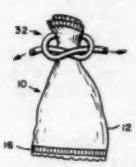
APPARATUS FOR MAKING EASY OPEN AND RECLOSABLE BAGS

Andrew McG. Martin, 3 Arlington St., Boston, Mass. 02116; Kenneth C. Meyers, West Newton, and Daniel F. Pawling, Newton, both of Mass., assignors to Andrew McG. Martin, Boston, Mass.

Division of Ser. No. 600,419, Apr. 16, 1984, Pat. No. 4,609,107. This application May 23, 1986, Ser. No. 846,364

Int. Cl.[4] B31B *1/64*

U.S. Cl. 493—206 **6 Claims**



1. Apparatus for making a series of sealed bags from a tube of flexible material which tube has a longitudinal axis, the improvement comprising

A. a set of complimentary sealing jaws, said jaws having

(1) first and second counterfacing corrugated surfaces defining a bag bottom sealing portion, and a bag top sealing portion, respectively, for sealing together the opposite walls of said tube to form the bottom seal of one bag and the top seal of an adjacent bag, said corrugations extending parallel to the tube axis so that the seals including corrugations which extend parallel to said axis,

(2) third counterfacing surfaces between said first and second counterfacing surfaces for forming a mold chan-

nel in said tube walls which extends generally perpendicular to said tube axis, and

(3) means between said third counterfacing surfaces and one of said first and second counterfacing surfaces for forming a series of perforations through said tube walls between one of said seals and said mold channel therein; and

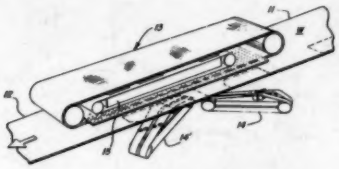
B. means for moving the jaws into contact, with the tube walls extending between them.

4,682,977

APPARATUS FOR FOLDING SPACED SEGMENTS OF WEB MATERIAL

Gerald W. Buxton, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 21, 1986, Ser. No. 887,218
Int. Cl.[4] B05B *1/14*
U.S. Cl. 493—358 **7 Claims**



1. Apparatus for folding spaced segments of flexible web material comprising a relatively elongated frame, means on said frame for advancing a web along a linear path, said web having upper and lower opposite surfaces,

means in said web path for generally transversely cutting said web partway across from a longitudinally extending edge at longitudially spaced lines to develop foldable flap portions each having a longitudially extending free edge,

a vacuumized continuously moving belt means down stream in said path from said cutting means for selectively gripping said upper surface of said web except for said flap portions,

a frictionalized continuously moving belt system aligned in said path with said vacuumized belt means for engaging said lower surface of said web, said frictionalized belt system being arranged at an angle to said path to progressively fold said flap portions while said web material is advancing in said path and having its speed related to the speed of said advancing means by the secant of said angle, said frictionalized belt system including gripper means for folding each flap portion commencing adjacent said longitudinally extending free edge and generating a line of folding moving progressively inward from said longitudinally extending free edge.

4,682,978

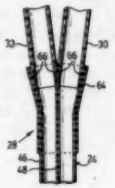
DUAL LUMEN CANNULA

Geoffrey S. Martin, Mississauga, Canada, assignor to Vas-Cath of Canada Limited, Mississauga, Canada

Filed May 15, 1985, Ser. No. 734,225
Claims priority, application Canada, May 24, 1984, 454986
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—43 **3 Claims**

1. A dual lumen cannula comprising:

a flexible elongate tubular portion consisting of a tubular wall separated by an integral septum into similar extraction and return lumens, the cannula having a generally tapered leading end to facilitate insertion and blood extraction and blood return openings communicating with respective extraction and return lumens in proximity to the leading end, the extraction and return lumens terminating at an other end of the tubular portion at similar conically-shaped inner surfaces, each inner surface adapted to receive ends of respective blood extraction and blood return tubes, each said end of the tubes having a generally conically shaped outer surface and the walls of each end narrowing towards a tip which has minimal wall



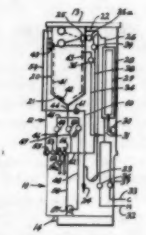
thickness so that the interiors of the respective tubes and lumens form substantially smooth surfaces to minimize blood damage.

4,682,979

COLON WASHING METHODS AND APPARATUS

Jimmy J. Girouard, P.O. Box 1401, Groves, Tex. 77619

Filed Jun. 17, 1985, Ser. No. 744,958
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—48 **10 Claims**

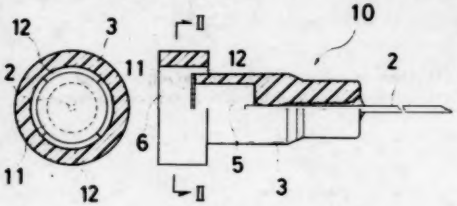


1. Apparatus for use in washing the colon of a person, comprising an elevated tank having a bottom outlet, means for filling said tank with water, said tank having an overflow drain at an upper level, a cross conduit having at one end a flow connection to an implement for delivering water into a person's colon, a solenoid operated shut-off valve and a check valve in series in said cross conduit, a manifold connected to said bottom outlet of said tank and having valve controlled first, second and third branches, said first branch being connected to said cross conduit between said check valve and said solenoid valve to permit flow of water from said tank to said cross conduit in by-pass relation to said solenoid operated valve, said second banch being connected to said cross conduit upstream of said check valve and said solenoid operated valve, and said third branch being connected to the inlet of a pump, the outlet of which is connected to said cross conduit at a point upstream of said check valve and said solenoid operated valve whereby water may be transmitted from said tank to said implement by gravity through said first and second branches or by said pump through said third branch.

4,682,980
PUNCTURE NEEDLE ASSEMBLY

Tatsuo Suzuki, Yokohama, Japan, assignor to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 706,906, Mar. 1, 1985, abandoned, which is a division of Ser. No. 409,598, Aug. 19, 1982, abandoned. This application Aug. 8, 1986, Ser. No. 894,724
Claims priority, application Japan, Aug. 19, 1981, 56-129577; Dec. 8, 1981, 56-198235
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—122 **9 Claims**



1. A method for inserting a puncture needle assembly into a relatively deep blood vessel, said puncture needle assembly comprising a puncture needle having a point and being provided with a through bore, a transparent or translucent puncture needle hub fixed to the end of said puncture needle opposite to said point; and an air vent plug adapted to be detachably connected to said puncture needle hub in a liquid-tight manner; said air vent plug having a pressing surface at the most distal end surface thereof opposite to said puncture needle and adapted to be engaged by a hand of a user for transmitting a puncture force from a hand of a user in the axial direction of said puncture needle via said pressing surface, said pressing surface being ring-like and defining an opening which is open to the atmosphere, and said air vent plug having a side peripheral wall adjacent said pressing surface; said air vent plug including means adapted to form, when it is connected to said puncture needle hub, a passage providing communication between said through bore of said puncture needle and the atmosphere, said passage being opened to the atmosphere through at least one side opening recessed from said pressing surface and opening into the side peripheral wall of said air vent plug, said at least one side opening being sized so as to be left uncovered by any part of the hand of the user when said puncture force is applied by said hand to said pressing surface at said distal end of the air vent plug; and an air-permeable blood-tight member disposed in said passage at the upstream side from said at least one side opening, said through bore of said puncture needle being in communication with the atmosphere through said air-permeable blood-tight member and said at least one side opening in said air vent plug;

said method comprising the steps of:

holding said puncture needle assembly in the hand of a user;

putting a portion of the hand of the user on said pressing surface of said air vent plug;

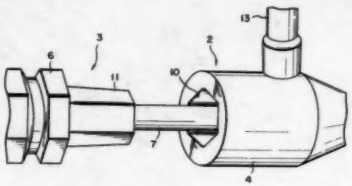
thrusting, by the user's hand, the puncture needle assembly via an applied thrusting force on said air vent plug in the axial direction of said puncture needle assembly to transmit a puncture force from the user's hand to said air vent plug and hence to said puncture needle while leaving open and uncovered said at least one side opening of said air vent plug; and

directing the puncture needle of said puncture needle assembly to puncture the blood vessel responsive to said thrusting by the user.

4,682,981
MEDICAL DEVICE

Tatsuo Suzuki, Machida, and Atsushi Matsumoto, Fuji, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,613
Claims priority, application Japan, Aug. 7, 1984, 59-165452
Int. Cl.[4] A61M 29/00
U.S. Cl. 604—158 **5 Claims**



1. A medical device, comprising:

a first elongated hollow cylindrical member;

a first hollow hub member fixed to a proximal end of said first cylindrical member, the interior of said first hub member communicating with the interior of said first cylindrical member;

a second elongated hollow cylindrical member detachably insertable into said first cylindrical member;

a second hollow hub member fixed to a proximal end of said second cylindrical member, the interior of said second hub member communicating with the interior of said second cylindrical member;

first means for preventing relative axial movement of said first and said second cylindrical members, including a first annular rib formed on the outer surface of said second hub member, and a second annular rib formed on the inner surface of said first hub member, said first rib being located to position beyond said second rib to prevent said axial movement when said second cylindrical member is inserted into said first cylindrical member; and

second means for preventing relative circumferential rotation of said first and said second cylindrical members, including a female polygonal prism surface defining the inner surface of said first hub member, and a male polygonal prism surface defining the outer surface of said second hub member, said male prism being fitted into said female prism to prevent said rotation when said second cylindrical member is inserted into said first cylindrical member.

4,682,982

ANTISTATIC N-HIGHER MONO ALKYL AND MONO ALKENYL NEOALKANAMIDES, PROCESSES FOR MANUFACTURING THEREOF, ANTISTATIC COMPOSITIONS CONTAINING SUCH AMIDES, AND PROCESSES FOR DECREASING ACCUMULATIONS OF STATIC CHARGES ON LAUNDRY

Robert J. Steltenkamp, Somerset, and Michael A. Camara, Jackson, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,871
Int. Cl.[4] D06M *13/38;* **C07C** *103/34*
U.S. Cl. 8—137 **19 Claims**

12. A detergent composition comprising a detersive proportion of a synthetic organic detergent and a proportion, which is antistatic characteristic imparting to laundry during washing of N-higher monoalkyl neoalkanamide or N-higher monoalkenyl neoalkanamide or a mixture thereof, wherein the higher alkyl and higher alkenyl or mixture thereof are of numbers of carbon atoms in the range of 8 to 20, and the neoalkanoic moiety is of 5 to 16 carbon atoms.

4,682,983

TRANSFER SHEET FOR THE THERMAL DRY IMPRESSION OF CELLULOSE FIBERS

Wolfgang Mehl, Geneva, Switzerland, assignor to Sicpa Holding S.A., Glarus, Switzerland

Continuation of Ser. No. 598,286, Mar. 7, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 842,592
Claims priority, application Switzerland, Jul. 12, 1982, 4225/82
Int. Cl.[4] B41M *5/02, 3/12;* **D06P** *1/16*
U.S. Cl. 08—468 **13 Claims**

1. A transfer sheet for the heat transfer printing of textile materials which contain cellulosic fibers pre-treated for swelling, said sheets consisting essentially of an inert, flexible substrate having a release coating on a least one-surface thereof, said release coating carrying a dyestuff-containing coating or design, wherein the dyestuff-containing coating or design is a mixture containing

(a) a binder containing at least one high molecular, organic, film forming substance having a softening point between 50° and 150° C., said binder selected from the group consisting of naturally occuring resins, maleinate resins, phenolic resins, urea resins, polymerized unsaturated hydrocarbons, epoxy resins, polymide resins and rosin modified resins, and

(b) at least one disperse or vat dyestuff, said dyestuff does not sublimate in conventional heat transfer printing, said dyestuff having an optical absorptivity not exceeding 0.3 when in a boiling, saturated solution in 0.1 molar aqueous sodium carbonate and

(i) that the dyestuff is transferred from a transfer paper normally used in heat transfer printing, at a rate of not more than 40% by weight when said transfer sheet is pressed against the textile material under a contact pressure of 5 kPa and maintained under atmospheric air pressure for 30 seconds at 200° C., the textile material being swollen with water and whose swollen state has been preserved after drying by a polyglycol or a polyglycol derivative, and

(ii) that the dyestuff is transferred at a rate of more than 60% by weight when said transfer sheet is pressed against the textile material under a contact pressure of 50 kPa, and at an atmospheric air pressure of 10 kPa, for 30 seconds at 230° C.

4,682,984

DIESEL FUEL ADDITIVE

Alan H. Epler, 3303 Rock Springs St., Cheyenne, Wyo. 82001

Filed Sep. 2, 1983, Ser. No. 529,109
Int. Cl.[4] C01L *1/02*
U.S. Cl. 44—56 **10 Claims**

1. A liquid additive for a liquid fuel, selected from the group consisting of gasoline, diesel oil, and heating oil consisting essentially of:

(a) kerosene,

(b) an anhydrous aliphatic ether, and

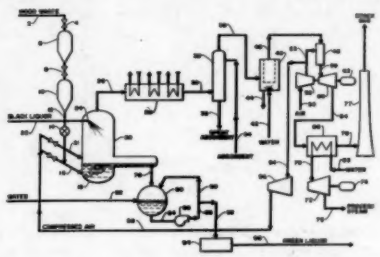
(c) a liquid aromatic hydrocarbon selected from the group consisting of xylene, napthalene and mixtures thereof, the kerosene, ether and hydrocarbon being present in a respective volumetric ratio of about 9:1:1.

4,682,985

GASIFICATION OF BLACK LIQUOR

Arthur L. Kohl, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 699,498, Feb. 8, 1985, which is a continuation of Ser. No. 486,274, Apr. 18, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 779,321
Int. Cl.[4] C10J *3/00*
U.S. Cl. 48—197 R **7 Claims**



1. A process for treating a concentrated aqueous black liquor carbonaceous material and alkali metal sulfur compounds to form a combustible gas and a sulfide-rich melt comprising:

(a) providing a gasifier vessel maintained at a pressure of from about 1 to 50 atmospheres and containing a relatively shallow molten salt pool at its bottom within a sump equipped with an overflow discharge, said vessel having

(I) a black liquor drying zone at its upper parts,

(ii) a black liquor solids gasification zone located below the drying zone, and

(iii) a molten salt sulfur reduction zone comprising said molten salt pool;

(b) introducing into the top of said drying zone the concentrated aqueous black liquor containing carbonaceous material and alkali metal sulfur compounds;

(c) evaporating water from said concentrated aqueous black liquor in said drying zone by direct contact of said aqueous black liquor with the hot gas rising from the gasification zone to produce dried black liquor solids, which fall into said gasification zone, and a cooled combustible gas container water vapor said combustible gas being at a temperature below the melting point of entrained droplets of the molten salt causing solification of said droplets;

(d) introducing a first portion of an oxygen-containing gas into the gas space in the gasification zone located below the drying zone immediately above the molten salt pool to partially oxidize and gasify a fraction of the carbonaceous material in said dried black liquor solids falling through said zone to form a hot combustible gas;

(e) introducing a second portion of said oxygen-containing gas beneath the surface of said molten salt pool in an amount sufficient to cause gasification of essentially all carbonaceous material entering the pool from the gasification zone but not sufficent to create oxidizing conditions in the pool, the formed gas rising from said pool, the total amount of said first and second portion of oxygen-containing gas constituting between 25 and 55% of the amount of oxygen-containing gas required for complete combustion

of the black liquor feed and representing the total amount of oxygen-containing gas fed to said gasifier vessel;

(f) withdrawing said cooled combustible gas having a higher heating value of at least about 90 Btu/scf (dry basis) from an upper portion of said drying zone; and

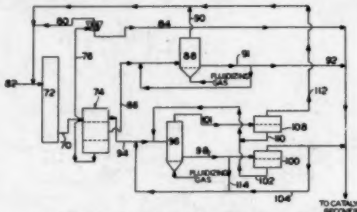
(g) withdrawing from said overflow discharge in the molten salt reduction zone a melt in which the sulfur content is predominantly in the form of alkali metal sulfide.

4,682,986

PROCESS FOR SEPARATING CATALYTIC COAL GASIFICATION CHARS

Wei-Kuo Lee, Bridgewater, N.J., and Hin-Wan Wong, Houston, Tex., assignors to Exxon Research and Engineering, Florham Park, N.J.

Filed Nov. 29, 1984, Ser. No. 676,504
Int. Cl.[4] C10J *3/00, 3/54*
U.S. Cl. 48—210 **13 Claims**



1. A catalytic coal gasification process including the separation of chars containing soluble catalysts produced by the catalytic coal gasification process comprising the steps of:

(a) separating the chars by size into three portions, a first char portion having the largest average diameter, a second char portion having the middle average diameter, and a third char portion having the smallest average diameter,

(b) subjecting the third char portion to a separation to recover a carbon-rich lighter fraction which is recycled to the catalytic coal gasification process and a carbon-lean heavier fraction suitable for treatment in a soluble catalyst recovery process,

(c) subjecting the second char portion to fluidization with an inert gas to recover a carbon-rich lighter fraction which is recycled to the catalytic coal gasification process and a carbon-lean heavier fraction suitable for treatment in a soluble catalyst recovery process,

(d) subjecting the first char portion to fluidization in the presence of host solids with an inert gas to recover a carbon-rich lighter fraction containing host solids and a carbon-lean heavier fraction containing host solids,

(e) separating the carbon-rich lighter fraction made from the first char to produce a carbon rich recycle char which is recycled to the catalytic coal gasification process and host solids, and

(f) separating at least a portion of the carbon-lean heavier fraction made from the first char to produce solids suitable for treatment in a soluble catalyst recovery process and host solids.

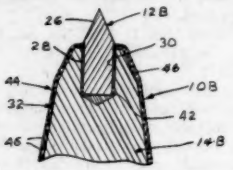
4,682,987

METHOD AND COMPOSITION FOR PRODUCING HARD SURFACE CARBIDE INSERT TOOLS

William J. Brady, 1767 Wishingwell Dr., Creve Coeur, Mo. 63141, and Harlan U. Anderson, 45 Johnson St., Rolla, Mo. 65401

Continuation-in-part of Ser. No. 254,998, Apr. 16, 1981, abandoned. This application Jul. 15, 1985, Ser. No. 755,316
Int. Cl.[4] B24D *3/00*
U.S. Cl. 51—293 **40 Claims**

1. A heavy duty cutting tool of the type subjected to large impact forces in performing such cutting functions as trenching, boring, drilling, sawing, plowing, crushing and the like as in industrial mining and like operations, said cutting tool including a tempered steel body and having primary cutting means thereon and a wear surface extending away from said primary cutting means, and a hard surface coating applied to



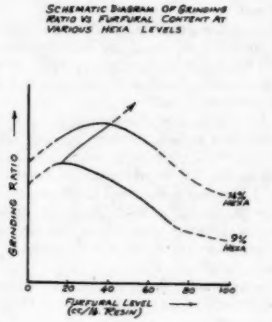
said primary cutting means and said wear surface, said hard surface coating comprising a metal alloy composition having a high nickel content in the range of 45–75 weight percent and a substantial amount in the range of 5–25 weight percent of a glass-forming fluxing agent, and said coating being fused to said tool body at a temperature in the range of 1830°–1925° F. with a resultant hardness in the range of 55–68 Rockwell C.

4,682,988

PHENOLIC RESIN BONDED GRINDING WHEELS

Kesh S. Narayanan, Holden, and Gordon E. Hickory, Upton, both of Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 06/442,547, Nov. 18, 1982, abandoned, which is a continuation of Ser. No. 06/170,383, Jul. 21, 1980, abandoned. This application Oct. 25, 1983, Ser. No. 545,321
Int. Cl.[4] C09K *3/14*
U.S. Cl. 51—298 **7 Claims**



1. A phenolic resin bonded grinding wheel with an improved grinding ratio in which hexamethylenetetramine is the curing agent and furfural is the wetting agent applied, at least in part, to the abrasive grain in the preparation of the wheel mix, said furfural being used in an amount of from 20 to 60 cubic centimeters per pound of resin, the furfural being incorporated in the wheel formulation in an increasing amount as the amount of hexamethylenetetramine curing agent in the resin increases from 12% to 20% by weight, the relationship of

the amounts of furfuralto hexamethylenetetramine being approximately $F=H+35$ where F is the amount of furfural expressed in cubic centimeters per pound of resin and H is the amount of hexamethylenetetramine expressed in weight percent of the powdered resin.

4,682,989

METHOD OF RECOVERING VOLATILE FOAMING AGENT FROM PREFOAMED BEADS OF POLYOLEFIN RESINS

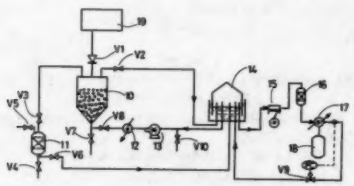
Hirofumi Maeda, Takatsuki, Japan, and Naruhiko Akamatsu, Berchem, Belgium, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1985, Ser. No. 789,672

Claims priority, application Japan, Oct. 23, 1984, 59-222524

Int. Cl.⁴ B01D *53/14*

U.S. Cl. 55—23 **4 Claims**



1. A method of recovering a volatile foaming agent from prefoamed beads of polyolefin resin, which comprises heating polyolefin resin beads containing a volatile foaming agent, thereby obtaining prefoamed beads; contacting said prefoamed beads with circulating heated air; causing the volatile foaming agent contained in the prefoamed beads to escape into the circulating heated air, while suppressing the contraction of the prefoamed beads, and recovering said volatile foaming agent from said circulating heated air by liquefaction.

4,682,990

METHOD AND APPARATUS FOR CLEANING WATERY VENTILATING AIR CONTAINING LIQUIDS WHICH HAVE BEEN GASIFIED DURING COOLING OR LUBRICATION OF CONVERTING MACHINES, PARTICULARLY ROLLING MILLS

Per-Olof Kagström, and Lars Abrahamsson, both of Finspång, Sweden, assignors to Gränges Aluminium Aktiebolag, Lidingö , Sweden

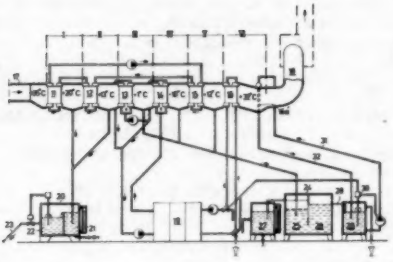
PCT No. PCT/SE83/00030, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/02569, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 28, 1983, Ser. No. 545,385

Claims priority, application Sweden, Jan. 29, 1985, 8200500

Int. Cl.⁴ B01D *5/00;* **F24F** *3/14*

U.S. Cl. 55—80 **11 Claims**



1. A method of cleaning humid ventilating air containing cooling or lubricating liquids which have been gasified during cooling or lubrication of converting machines, particularly rolling mills, comprising: cooling the ventilating air in at least one stage to a temperature below the condensing point of the gasified cooling or lubricating liquids and of the water in the ventilating air so that said gasified liquids and said water contained in the ventilating air condense; collecting the condensed cooling or lubricating liquids and the condensed water; separating at least a substantial portion of the condensed cooling or lubricating liquids from said water; and returning the condensed water mixed with any remaining condensed cooling or lubricating liquids to the cleaned and dried ventilating air produced after said step of cooling to cause same to be absorbed by the ventilating air.

4,682,991

METHOD AND APPARATUS FOR SCRUBBING FLUE GAS WITH FLOWABLE ABSORBING MATERIAL PURSUANT TO THE AIR FLOW ATOMIZATION PRINCIPLE

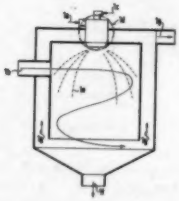
Klaus Grethe, and Hubert Steven, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,787

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504167

Int. Cl.⁴ B01D *3/26, 53/18*

U.S. Cl. 55—84 **19 Claims**



1. A method of scrubbing flue gas that is charged with noxious material, with scrubbing being accomplished via flowable absorbing material in a gas-scrubbing unit having an atomizing device with at last one independent nozzle that has an outlet and in which, pursuant to the air flow atomization principle, the absorbing material, as atomizing material, is atomized in parallel flow with a gas, as an atomizing medium, to form a fine droplet stream while at the same time the atomizing material and the atomizing medium are intensively mixed; said method includes the steps of:

providing each nozzle with edge means having two sides;

introducing atomizing material into a given nozzle in such a way that said material forms a film on one side of said edge means;

splitting each atomizing medium stream into two partial streams;

passing one of said partial streams through a given nozzle in such a way that it passes over said film of atomizing material on one side of said edge means in the direction toward said outlet of said nozzle, so that said film of atomizing material is forced toward said outlet, where said film is atomized, via said edge means, as it passes thereover, to form a fine droplet stream; and

passing the other of said partial streams through said given nozzle on that side of said edge means remote from said film of atomizing material, and mixing this other partial stream with said fine droplet stream.

13. An apparatus for scrubbing flue gas that is charged with noxious material, with scrubbing being accomplished via flowable absorbing material in a gas-scrubbing unit having an atomizing device with at least one independent nozzle that has an

outlet and in which, pursuant to the air flow atomization principle, the absorbing material, as atomizing material, is atomized in parallel flow with a gas, as an atomizing medium, to form a fine droplet stream while at the same time the atomizing material and the atomizing medium are intensively mixed; each nozzle also has inlet means for said atomizing material and for said atomizing medium; each nozzle further comprises:

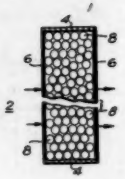
edge means ending adjacent said nozzle outlet and having two sides; said nozzle has first opening means, disposed remote from said nozzle outlet, for supplying atomizing material to one of said sides of said edge means; said nozzle has second opening means, also disposed remote from said nozzle outlet, for supplying a first partial stream of atomizing medium to that side of said edge means that is supplied with said atomizing material; said nozzle also has a third opening means for supplying a second partial stream of atomizing medium to the other side of said edge means.

4,682,992

MICROBICIDAL COATED BEADS

Alfred E. Fuchs, Denville, N.J., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Jun. 25, 1984, Ser. No. 624,350
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—279 **20 Claims**



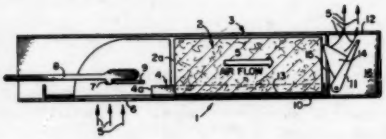
1. A composition consisting essentially of discrete and separate minute and inorganic spheroidal particles coated with surface hindered microbicidal agents which microbicidal agents are firmly bound to the surface of the inorganic particles to provide a dry microbicidal coating on each of said particles.

4,682,993

FLUID FILTER SYSTEM WITH REPLACEABLE FILTER ELEMENT

Christian A. Todd, Denver, and William D. Hart, Louisville, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 562,386, Dec. 16, 1983, abandoned. This application May 1, 1985, Ser. No. 729,377
Int. Cl.[4] B01D *46/44*
U.S. Cl. 55—314 **3 Claims**



1. A fluid filter system having a replaceable filter element and comprising;

a housing plenum having:

a first interior chamber with an entrance port and an exhaust port located therein; and

a second interior chamber, in communication with the first chamber through an interconnecting passage, having an exhaust port located therein; and

means for positioning the filter element in the housing plenum in a first position between the entrance port and the exhaust port in said first interior chamber and for moving the filter element to a second position between the entrance port and the interconnecting passage, said means for positioning the filter element having:

means constructed so as to prevent fluid flow through the exhaust port in said first interior chamber, and said system further comprises;

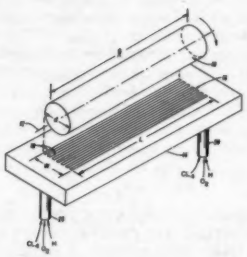
means constructed and arranged so as to be moved by said means for positioning for preventing fluid flow through the interconnecting passage whenever the filter element is not in the second position, said means for preventing fluid flow through the interconnecting passage positioned and arranged so as to be moved to an open position by said means for preventing fluid flow through the exhaust port in said first interior chamber whereby said interconnecting passage is open when the exhaust port in said first interior chamber is closed.

4,682,994

PROCESS AND APPARATUS FOR FORMING OPTICAL FIBER PREFORM

Robert J. Mansfield, Stow, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 16, 1985, Ser. No. 809,018
Int. Cl.[4] C03B *19/06, 37/027*
U.S. Cl. 65—3.12 **6 Claims**



1. A method for fabricating elongated optical fiber preforms, comprising the steps of:

supporting an elongated cylindrical substrate member for rotation about the longitudinal axis thereof, the substrate member having a length dimension and an exterior diameter dimension; and

forming and directing a homogeneous stream of silica precursor gases and a fuel gas towards the exterior of said substrate member, the fuel gas heating the precursor gases to a temperature range sufficient to effect reaction of the precursor gases to form a stream of silica particles, the stream of silica particles having approximately the same width as the exterior diameter of the substrate member and a length many times greater than its width.

4,682,995

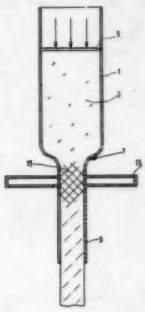
METHOD FOR THE MANUFACTURE OF GLASS BODIES BY EXTRUSION

Rolf Clasen, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,925
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511450
Int. Cl.[4] C03B *37/016*
U.S. Cl. 65—18.1 **11 Claims**

1. A method for the manufacturing of glass bodies, said method comprising:

(a) forming a thixotropic suspension of silicon dioxide particles in a dispersing liquid;
(b) converting said thixotropic suspension to a state of minimum viscosity;
(c) charging an extruding press closed at its outlet with said thixotropic suspension while said suspension is in a state of minimum viscosity;



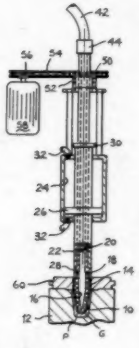
(d) heating said suspension, while in said extruding press to a temperature below the boiling point of said dispersing liquid to thereby cause linking of silicon dioxide particles dispersed in said suspension and solidification of said suspension;
(e) opening said extruding press and extruding a dimensionally stable green body formed of said solidified suspension from said press and
(f) purifying and sintering said green body.

4,682,996

PARISON FORMATION IN THE MANUFACTURE OF HOLLOW ARTICLES OF GLASSWARE

Thomas V. Foster, Doncaster; Stanley P. Jones, Tickhill, Nr. Doncaster, both of England, and David L. Alderson, Simsbury, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 23, 1986, Ser. No. 821,636
Claims priority, application United Kingdom, Jan. 26, 1985, 8501991
Int. Cl.[4] C03B *11/06*
U.S. Cl. 65—25.1 **17 Claims**



1. A method of forming parisons in the manufacture of hollow articles of glassware, the method comprising forming each parison by introducing a gob of molten glass into a mould cavity having the shape desired for the external surface of the parison, and moving a plunger into the mould cavity to cause the molten glass to conform to the shape of the cavity, wherein the method also comprises forming a layer of gas between a surface portion of the plunger and the molten glass so that, as the plunger moves into the cavity, the glass is pushed into shape by the layer of gas, and rotating the plunger while it is in the mould cavity about a longitudinal axis thereof.

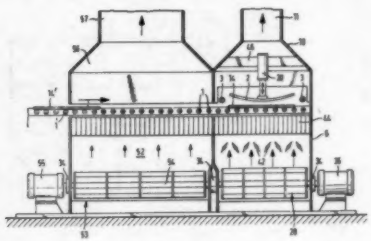
8. A plunger arrangement for use in forming parisons in the manufacture of hollow articles of glassware, the arrangement comprising a plunger, moving means for moving the plunger into a mould cavity, forming means for forming a layer of gas between a surface portion of the plunger and molten glass in the mould cavity, and means for rotating the plunger while it is in the mould cavity about a longitudinal axis thereof.

4,682,997

PROCESS AND APPARATUS FOR BENDING GLASS PLATES IN A HORIZONTAL POSITION

Friedrich Halberschmidt, Herzogenrath; Heinz-Josef Reinmold, Aachen; Norbert Schwarzenberg, Herzogenrath, all of Fed. Rep. of Germany; Herbert Radermacher, Faeren, Belgium; Kurt Blank; Josef Audi, both of Aachen, Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint Gobain Vitrage, Courbevoie, France

Filed Jul. 10, 1985, Ser. No. 753,501
Claims priority, application France, Jul. 13, 1984, 84 11148
Int. Cl.[4] C03B *23/02*
U.S. Cl. 65—106 **23 Claims**



1. A process for bending plates of a thermoplastic material such as glass or the like into a desired shape in a substantially horizontal position, wherein a substantially horizontal conveyor carries the plates from a reheating furnace into a bending station where the plates are lifted by a hot upward gas current and applied against an upper surface above the conveyor, and then lowered onto a carrier below the upper surface which carries the plates to a cooling station, comprising the steps of
curving the upper surface to have the configuration into which the plates are to be bent,
adjusting volume of flow and pressure of the hot upward gas current to a high level to apply plates against the upper surface so as to bend them, and after said bending, reducing the flow and pressure of the gas current to a lower level to lower the plates and place them on the carrier, said gas current still supporting a substantial part of the weight of the plates while the plates are on the carrier.

11. Apparatus for bending a plate of a thermoplastic material such as glass or the like in a one step operation into a final shape while in a substantially horizontal position, comprising
a bending station,
conveyor means in substantially horizontal disposition extending into the bending station, said conveyor means adapted to support said plate for movement to said bending station,
carriage means movable into said bending station for receiving said plate after it is bent to said final shape, and movable out of said bending station with said plate,
a bending surface mounted in the bending station above and

facing the conveyor means, said surface having a curvature to determine the final shape of the plate to be bent,

means for moving said bending surface in opposite directions toward and away from said conveyor means,

blower means comprising at least a first cross flow blower mounted in the bending station below the conveyor means and plate in the bending station for delivering an upward gas current to lift the plate from said conveyor means and apply it against said surface, said blower means providing sufficient gas lifting pressure in application of said plate against said surface whereby the upward gas current acts against the plate to bend the plate to the desired, final shape, and

evacuation means in said bending station above the conveyor means for receiving and evacuating gases blown from said blower means from said bending station.

4,682,998

ELECTRONIC SYSTEM FOR AUTOMATICALLY CONTROLLING THE WEIGHT OF GLASS GOBS IN A MOLTEN GLASS FEEDER

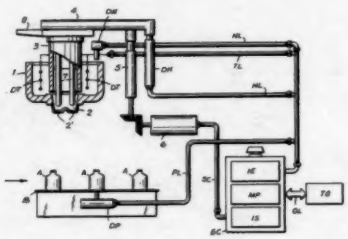
Ignacio L. Ayala-Ortiz, Garza Garcia, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Sep. 9, 1986, Ser. No. 905,710

Claims priority, application Mexico, Sep. 9, 1985, 206561

Int. Cl.[4] C03B *7/08*

U.S. Cl. 65—164 **6 Claims**



1. An electronic system for automatically controlling the weight of the glass gobs in a molten glass feeder of the type which includes, a feeder bowl which has feeder orifice; a rotating tube in the feeder bowl, aligned with the orifice and mounted on a mechanism that controls its rotation and height with respect to the orifice, in order to homogenize the glass in the feeder bowl and regulate the passage of the glass toward the orifice; at least a reciprocating plunger in the tube which is aligned with the orifice and mounted on a reciprocating mechanism which imparts and controls its reciprocating movement in order to push out a predetermined amount of glass toward the orifice; and at least a pair of reciprocating blades placed facing each other underneath the orifice and mounted on a reciprocating mechanism for cutting the glass gobs off the glass flow that comes out from the orificen and wherein the system comprising: a weight detector, a tube position detector coupled to said tube, and a temperature detector and a glass level detector placed at the feeder bowl, all of which provide representative signals of the weight of the finished articles, of the height of the tube with respect to the orifice, of the glass temperature and of the level of the glass in the feeder bowl; a data processor which receives and processes the signals of the detectors in order to compare the weight of the finished articles with the predetermined weight for the same and relate the weight deviations with the temperature, the glass level and the height of the tube, so as to provide height compensation signals to the tube mechanism in order to permit the adequate passage of the glass toward the orifice in order to obtain the predetermined weight for the articles; and an operator panel interconnected with the data processor in order to provide and obtain the information from the same.

4,682,999

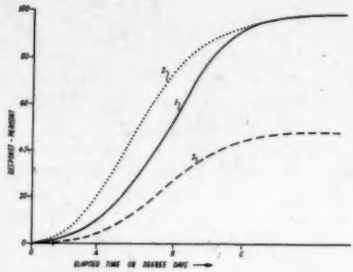
METHODS FOR ENHANCING THE PRODUCTIVITY OF PLANTS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 793,699, Oct. 31, 1985. This application Dec. 11, 1985, Ser. No. 808,018

Int. Cl.[4] C05C *9/00*

U.S. Cl. 71—28 **54 Claims**



1. A method for enhancing a selected physiological response of plants other than beets and sugarbeets which comprises contacting the foliage of said plants during about the first half of the grand response period for said physiological response with a solution comprising dissolved biuret in an amount and under conditions sufficient to introduce into said plant a non-phytoltixic amount of biuret sufficient to enhance said selected response.

4,683,000

HERBICIDAL SULFONAMIDES

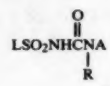
W. Christian Petersen, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Comany, Wilmington, Del.

Filed Dec. 22, 1983, Ser. No. 564,379

Int. Cl.[4] C07D *403/12;* A01K *47/36*

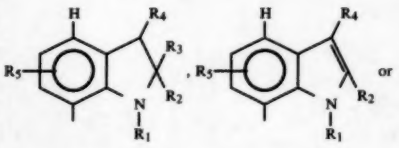
U.S. Cl. 71—92 **16 Claims**

1. A compound having the formula:

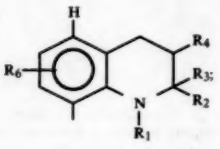


I

wherein



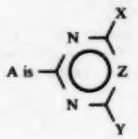
L-1 L-2



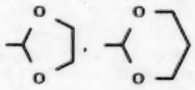
L-3

R is H or CH_3;
R_1 is H, C_1–C_3 alkyl or C_3 alkenyl;
R_2 is H, C_1–C_3 alkyl, CO_2R_7 or $CON(CH_3)_2$;
R_3 is H or CH_3;
R_4 is H of CH_3;
R_5 is H, CH_3, CH_2CH_3, F, Cl, Br, OCH_3, OCF_2H, SCH_3, SCF_2H or CF_3;
R_7 is CH_3 or CH_2CH_3;

A-1



X is Cl, Br, C_1–C_2 alkyl, C_1–C_2 alkoxy, OCF_2H or CF_3;
Y is H, NH_2, $NHCH_3$, $N(CH_3)_2$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of (a), F, (b) Cl or (c) Br, CH_2OCH_3, $CH_2OC_2H_5$, C_{1-C4} alkoxy, C_1–C_2 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$, OCH_2CH_2F, OCH_2CH_2Cl, OCH_2CH_2Br, OCH_2CF_3, $CH(OCH_3)_2$, $CH(OC_2H_5)_2$,



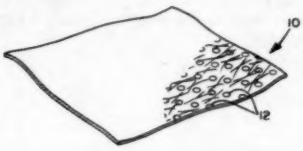
or OCF_2H;
Z is CH;
provided that
(1) when R_3 is CH_3, then R_2 is H or CH_3;
(2) when R_4 is CH_3, then R_2 is other than H; and
(3) when X is Cl or Br, then Y is NH_2, $NHCH_3$, $N(CH_3)_2$, CH_3, OCH_3 or OCF_2H.

4,683,001

ONE STEP DRY-AND-SHINE POLISHING CLOTH

David T. Floyd; Garry L. Shanklin, both of Outagamie County; Gordon E. Lynch, Winnebago County, and Gary H. Meitner, Winneconne, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 23, 1985, Ser. No. 768,905
Int. Cl.[4] C09G *1/00*
U.S. Cl. 106—3 **27 Claims**



1. A drying and polishing wipe that simultaneously dries and polishes a wet surface comprising an absorbent cloth partially filled in discontinuous areas with a polishing composition comprising a mixture of saponified and nonsaponified waxes, silicone oil and detergent or soap wherein said cloth having discontinuous areas of polishing composition will provide a hydrophobic covering in said discontinuous areas thereby causing said wipe to not absorb water in said discontinuous areas but said wipe will absorb water in areas other than said discontinuous areas.

4,683,002

LIQUID COMPOSITION AND METHOD FOR RECORDING

Konoe Mirua; Hiroshi Takimoto, both of Yokohama; Toshio Kaneko, Machida; Tokuya Obta, Yokohama; Masatsune Kobayashi, Yokohama, and Tsuyoshi Eida, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,416
Claims priority, application Japan, Nov. 8, 1984, 59-234204
Int. Cl.[4] C09D *11/00*; G01D *9/00, 15/18*
U.S. Cl. 106—20 **17 Claims**

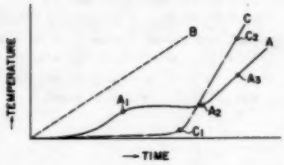
1. A liquid composition comprising a water-soluble dye, wherein said composition has a total concentration of iron and silicon at 9 ppm or less.

4,683,003

PROCESS FOR PRODUCTION OF CELLULAR CONCRETE

Sota Nakano, Tokyo, and Masaaki Ozawa, Niiza, both of Japan, assignors to Misawa Home Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1985, Ser. No. 723,253
Claims priority, application Japan, Jul. 30, 1984, 59-159958
Int. Cl.[4] C04B *7/02*
U.S. Cl. 106—86 **9 Claims**



1. In a process for production of cellular concrete which comprises: mixing a first aqueous slurry of a cement compound comprising calcium silicate as a main hydraulic mineral component, a second aqueous slurry of a rapid-hardening cement compound comprising calcium aluminate as a main hydraulic mineral component, and an aqueous foamed liquid to prepare a foamed slurry of a rapid-hardening cement compound; molding said foamed slurry; and then subjecting the resulting molded article to high-temperature and high pressure hydrothermal curing, the improvement wherein a first cement-setting retarder consisting essentially of an alkali metal salt of a hydroxycarboxylic acid is dissolved in said first aqueous slurry, and a second cement-setting retarder consisting essentially of a combination of a hydroxycarboxylic acid or an alkali metal salt thereof with an alkali metal salt of an inorganic weak acid is dissolved in said second aqueous slurry to provide successively an initial setting period, an exotherm-dwell period in which the setting of said foamed slurry of said rapid-hardening cement compound is substantially stopped and a subsequent setting period.

4,683,004

FOAMABLE COMPOSITIONS AND PROCESSES FOR USE THEREOF

Errol D. Goddard, Haworth, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 20, 1985, Ser. No. 767,813
Int. Cl.[4] A61K *7/02, 7/06*; C08L *1/26*
U.S. Cl. 106—170 **38 Claims**

1. A foamable composition comprising water; foam stabilizer consisting essentially of a non-ionic cellulose ether having a sufficient degree of non-ionic substitution selected from the class consisting of methyl, hydroxyethyl and hydroxypropyl to cause the ether to be water-soluble, the cellulose ether being further substituted with a long chain alkyl radical having 10 to 24 carbon atoms in an amount between about 0.2 weight percent and the amount which renders the cellulose ether less than

1% by weight soluble in water; and means for providing gas in the composition for foam generation therein.

4,683,005

ROAD ASPHALT COMPOSITIONS CONTAINING HYDROCRACKED PITCH

Marc-André Poirier, Sarnia, Canada, assignor to Mines and Resources Canada, Ottawa and Petro Canada Inc., Calgary, both of, Canada

Continuation-in-part of Ser. No. 664,398, Oct. 19, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 849,411

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—273 R **4 Claims**

1. A paving grade asphalt composition having an ASTM penetration value of at least 85 at 25° C. and a solubility in trichloroethylene of at least 99.0% comprising a blend of:

(a) a petroleum pitch having a boiling point above 524° C. obtained as a residue in the hydrocracking of hydrocarbon oils to a pitch conversion of at least 80% and containing up to 10% by weight saturates, about 10–30% by weight aromatics, about 15–30% by weight resins and about 30–55% by weight asphaltenes and

(b) as a diluent therefor an unprocessed distillation residue having a minimum initial boiling point of 370° C. obtained from a bitumen from tar sands, or heavy oils, the pitch being present in the composition in an amount of at least 25% by weight of the total composition.

4,683,006

BUILDING MATERIALS

Bryan J. Walker, Bedford, England, assignor to 501 Granulite Limited, Oxfordshire, England

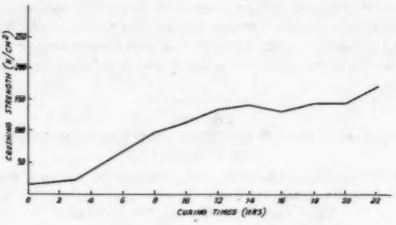
PCT No. PCT/GB85/00158, § 371 Date Feb. 12, 1986, § 102(e) Date Feb. 12, 1986, PCT Pub. No. WO85/04649, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 11, 1985, Ser. No. 817,744

Claims priority, application United Kingdom, Apr. 12, 1984, 8409468

Int. Cl.⁴ C04B *14/00*

U.S. Cl. 106—288 R **10 Claims**



1. A building material in pellet form, the material being formed from pulverized fly ash and not more than 5% by weight of added lime (calculated as CaO), the pellets being internally bonded by a pozzolanic bond comprising mechanical bonds formed by crystallites of etteringite and amorphous calcium silicate, calcium aluminate or calcium alumosilicate or mixtures thereof.

4,683,007

TITANIUM DIOXIDE DISPERSIONS AND PROCESSES FOR THEIR PRODUCTION

Carl Horowitz, Brooklyn; John M. Ryan, Woodhaven; Mohan L. Sanduja, Flushing, all of N.Y.; Kenneth K. Sugathan, Piscataway, N.J., and Paulose P. Thottathil, Brooklyn, N.Y., assignors to Forsythe Cosmetic Group, Ltd., Lawrence, N.Y.

Continuation of Ser. No. 581,653, Feb. 21, 1984, abandoned. This application Jun. 25, 1985, Ser. No. 748,692

Int. Cl.⁴ C09C *1/36*

U.S. Cl. 106—308 M **14 Claims**

1. A stable dispersion comprising:

(1) titanium dioxide; and (2) nitrocellulose grafted directly to a polymer or copolymer consisting of monomers of the formula

wherein Y is CH_3 or H and X is

or —OR, and R is alkyl, allyl or phenyl.

2. A process for preparing a stable dispersion for use as a lacquer, which comprises: (1) preparing a dispersion of nitrocellulose; (2) contacting the dispersion with one or more of the monomers selected from the group consisting of

wherein Y is CH_3 or H and X is

or —OR, and R is alkyl, allyl or phenyl; (3) initiating graft polymerization of the monomer directly onto the nitrocellulose through a free hydroxyl group of the nitrocellulose; and (4) adding titanium dioxide to the resulting dispersion.

3. A process for preparing a stable dispersion for use as a lacquer, which comprises: (1) preparing a dispersion of nitrocellulose and titanium dioxide; (2) contacting the dispersion with one or more of the monomers selected from the group consisting of

wherein Y is CH_3 or H and X is

or —OR, and R is alkyl, allyl or phenyl; and (3) initiating graft polymerization of the monomer directly onto the nitrocellulose through a free hydroxyl group of the nitrocellulose.

4,683,008

METHOD FOR CLEANING HARD SURFACES

James F. Betts, Akron, Ohio, assignor to Sparkle Wash, Inc., Bedford Heights, Ohio

Filed Jul. 12, 1985, Ser. No. 754,860
Int. Cl.[4] B08B *3/02, 3/08;* C11D *3/075*
U.S. Cl. 134—27 8 Claims

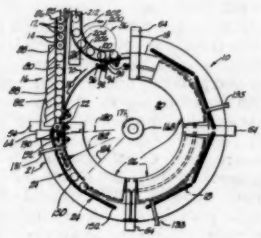
1. A method of cleaning substrates which comprises treating the substrate with an acidic aqueous solution having a pH below about 6.5 comprising at least amphoteric or nonionic detergent, and subsequently washing said treated substrate with an alkaline detergent comprising an aqueous solution of from about 10 to 50 parts by weight of an alkoxylated nonionic surfactant, about 10 to 90 parts by weight of an anionic detergent having at least 12 carbon atoms per molecule selected from the group consisting of sulfonates and sulfates, about 5 to 90 parts by weight of a metal salt of a lower molecular weight polycarboxylic acid, about 1 to 30 parts by weight of a water-soluble tertiary amine oxide and an effective amount of at least one alkaline metal hydroxide to maintain the aqueous solution at a pH greater than 7.5.

4,683,009

BOTTLE DRYING APPARATUS

Frank L. Shriver, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Apr. 1, 1985, Ser. No. 718,213
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—30 23 Claims



18. An apparatus for high speed production drying of polystyrene bottles, interior surfaces or the like having a generally cylindrical configuration with a tapering upper shoulder portion, and a neck portion defining a central bottle the apparatus comprising:

(a) a plurality of cylindrical sleeves having a diameter slightly greater than the maximum diameter of the bottles to be dried and having a height approximately equal to the shoulder height of the bottles, said cylindrical sleeves each having a base surface for supporting a bottom surface of a bottle thereon, an open upper end enabling insertion of a bottle into said sleeve in approximately coaxial relationship therewith, an inner centering and shock absorber means for centrally positioning and holding the bottle within said cylindrical sleeve and absorbing shocks and an opening in a lower portion thereof to facilitate removal of heating water therefrom;

(b) generally horizontally disposed sleeve infeed means for feeding said plurality of sleeve means and a plurality of bottles mounted in upright relationship therein into a drying path conveyor, said sleeve infeed means including a horizontal feed track and a horizontally disposed screw positioned parallel to said feed track, said screw having a spiral groove with a surface adapted to engage exterior surfaces of said sleeve means for producing spaced apart horizontal displacement of said sleeve means along said horizontal feed track;

(c) horizontally disposed drying table means rotatable about a central vertical axis for receiving said sleeve means in spaced apart relationship from said infeed means and for conveying said sleeve means and associated bottles through a drying path;

(d) horizontally disposed takeoff means for sequentially removing said sleeve means and associated bottles from said drying table means, said takeoff means comprising a horizontally disposed rotatable takeoff table positioned adjacent said drying table means and rotatable at a speed whereby the tangential peripheral speed of said drying table means is approximately equal to the tangential peripheral speed of said takeoff table;

(e) a plurality of circumferentially, equally spaced apart bracket means fixedly mounted on an outer peripheral portion of said rotatable drying table means and adapted to receive said sleeve means from said sleeve infeed means, said bracket means having at least two arm portions defining a radially outwardly opening enclosure and having rollers disposed thereon for allowing relative rotational movement of said sleeve means within said bracket means;

(f) resilient band means positioned proximate the periphery of said drying table means in generally tangential relationship therewith in frictionally contacting relationship with said sleeve means, said drying table mean being rotatable relative said band means whereby said sleeve means are rotatable within said bracket mean by said frictional contact with said band means;

(g) weir means for dispensing a uniform flow of heated water from an arcuate lip portion thereof positioned above said drying wheel, said lip portion being disposed such that said heated water flow is directed onto the shoulder portion of bottles positioned in said sleeve means at a position thereon outwardly of the bottle openings whereby said heated water heats the bottle without entering the bottle openings;

(h) drain channel means disposed below said table means beneath said bracket means for draining water flowing from said weir means;

(i) a plurality of air jet directing means fixedly mounted on said drying table means and operatively associated with said bracket means for directing a drying airflow into a bottle positioned in a sleeve engaged by said bracket means;

(j) manifold means fixedly mounted at a central position on said drying table means and connected in fluid communication with said air jet directing means for providing uniform pressure airflow to said air jet means; said manifold means being operatively attached to a heated, pressurized air source by an air duct and rotating seal;

(k) drive means for driving said infeed screw, said drying table means and said takeoff table in operatively synchronized relationship.

4,683,010

COMPACTED WIRE SEAL AND METHOD OF FORMING SAME

Hans J. Hartmann, Woonsocket, R.I., assignor to ACS Industries, Inc., Woonsocket, R.I.

Filed Oct. 1, 1985, Ser. No. 782,499
Int. Cl.[4] C23C *8/14*
U.S. Cl. 148—6.35 8 Claims

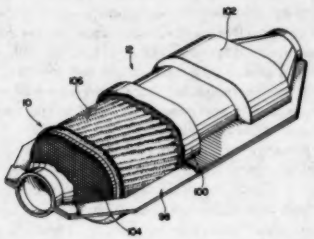
1. A method of forming a compacted wire ring seal comprising:

a. knitting a metal wire to form a tubular sock of a predetermined dimension;

b. rolling said sock on itself to form a knitted-wire ring;

c. heating said knitted-wire ring in an atmosphere containing oxygen to anneal the wire therein and to form metal oxides on the surfaces of said wire, said oxides comprising at

least approximately 0.025 m^3 of oxide per cm^2 of wire surface; and



d. compressing said knitted-wire ring to form a compacted wire-ring seal comprising at least approximately 45% by volumne of wire and oxide.

4,683,011

HIGH PENETRATION, HIGH SPEED, AGGLOMERATED WELDING FLUX

Robert J. Weaver, Mentor; Ronald F. Young, Willoughby, and Dennis D. Crockett, Mentor, all of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Aug. 28, 1986, Ser. No. 901,136

Int. Cl.[4] B23K *35/34*

U.S. Cl. 148—26 **4 Claims**

1. An agglomerated flux for electric arc welding comprised of fluorides selected from the group of calcium, sodium, potassium, barium, aluminum, magnesium, strontium and lithium and oxides selected from the group of aluminum, magnesium, silicon, strontium, titanium, calcium, zirconium, manganese and potassium wherein calcium oxide is present in amounts of from 11% to 25% and titanium dioxide is present in amounts of from 18% to 30% expressed as a percent of the total weight.

4,683,012

MAGNETIC THIN FILM

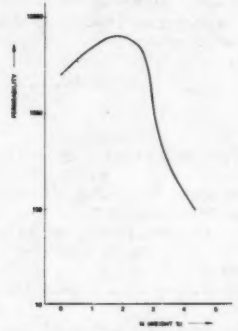
Kazushi Yamauchi; Muneyuki Ogata; Tomio Kobayashi; Makoto Kubota, and Tatsuo Kumura, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,342

Claims priority, application Japan, Apr. 18, 1984, 59-76434

Int. Cl.[4] C04B *35/00*

U.S. Cl. 148—301 **21 Claims**



1. A magnetic thin film formed by physical vapor deposition and having a composition represented by the following formula:

$$Fe_aAl_bSi_cN_d$$

wherein a, b, c and d each represents a weight percent of the respective elements and satisfies the following relations of

$$70 \leqq a < 95$$

$$2 \leqq b \leqq 10$$

$$4 \leqq c \leqq 15$$

$$0.2 \leqq d \leqq 4$$

$$a+b+c+d=100,$$

said film having a thickness more than 10 Å and less than 100 microns.

4,683,013

METHOD FOR PRODUCING A SHADOW MASK FOR A COLOR CATHODE RAY TUBE

Kenzaburou Iijima, and Yoshinori Hayashi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 12, 1985, Ser. No. 796,917

Claims priority, application Japan, Nov. 24, 1984, 59-248461

Int. Cl.[4] H01F *1/02*

U.S. Cl. 148—102 **3 Claims**

1. A method for producing a shadow mask for a colour cathode ray tube, comprising the steps of:

forming a plate from a spinodal decomposition type magnet alloy which contains 5 to 15 wt% of Co, 20 to 35 wt% of Cr and Fe in balance;

subjecting said plate to solution treatment;

subjecting said plate to a primary aging which is at a maximum temperature of 660° C.±5° C. and brought to termination at a cooling speed of 80° C.±10° C./Hr;

subjecting said plate to a secondary aging which is at a temperature of 635° C.±5° C., brought to termination at a cooling speed of 8° to 20° C./Hr and terminated at a temperature of 560° C.±10° C.; and thereafter

shaping said plate into a curved configuration of said shadow mask and forming an aperture therethrough for passage of an electron beam.

4,683,014

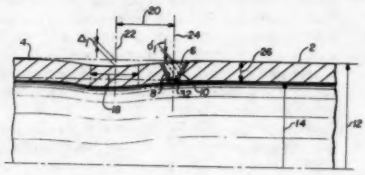
MECHANICAL STRESS IMPROVEMENT PROCESS

Jan S. Porowski, Pittsburgh; William J. O'Donnell, Bethel Park; Manu L. Badiani, Pittsburgh, and Edward J. Hampton, Murrysville, all of Pa., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1986, Ser. No. 845,863

Int. Cl.[4] C21D *7/02*

U.S. Cl. 148—131 **15 Claims**



1. A process for removing the residual tensile welding stresses in the inner layer of the weld metal and the heat-affected zone of steel piping elements that have been butt-welded to each other end-to-end by means of a circumferential weld which comprises mechanically introducing circumferential compressive stresses in said piping elements by applying a radial load inwardly on a section of at least one said piping elements away from said weld such that the distance from the

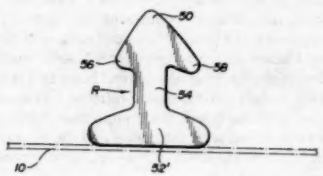
midplane of said section of said piping element upon which said radial load is applied to the weld midplane is equal to about two to about 12 times the thickness of said piping element upon which said radial load is applied, the distance from the edge of said section of said piping element upon which said radial load is applied that is adjacent said weld to the weld midplane being at least equal to about one-half the wall thickness of said piping element upon which said load is applied, the amount of said radial load being applied being sufficient to permanently reduce the outside diameter at the midplane of said section of said piping element in the range of about 0.2 to about 2.0 percent, the percent of permanent contraction of said steel piping at the midplane of said section upon which said radial load is applied being greater than the permanent contraction of said steel piping at the weld, midplane, said inner layer at the weld location assuming a concave configuration as a result of said application of said radial load.

4,683,015

METHOD OF FORMING FLEXIBLE FASTENER ELEMENTS AND SECURING THEM TO A TRAVELING WEB

Kevin J. Wagers, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 9, 1985, Ser. No. 753,100
Int. Cl.[4] B29D *5/00*
U.S. Cl. 156—66 **11 Claims**



1. A method of forming a ribbed plastic fastener element for use on a reclosable plastic container comprising the steps of melt processing a thermoplastic resin to form a flowable molten plastic resin and extruding said molten plastic resin from a die to form a rib element, said rib element upon exiting from said die having a tip and a concave tail, said tip and tail being connected together by an upstanding stem, the ratio of the overall height of said fastener element to the length of said tail being approximately 1:1.

4,683,016

PROCESS FOR FORMING A TWO PART CLOSURE

Herbert V. Dutt, Sarasota, Fla.; Istvan Foldesi, Laval, Canada, and Paul A. Santostasi, Sarasota, Fla., assignors to Sun Coast Plastics, Inc., Fla. and Montreal Milling Cutter and Company, Inc., Quebec, Canada

Filed Sep. 3, 1985, Ser. No. 771,952
Int. Cl.[4] B29C *65/02;* **B32B** *31/12, 31/20;* **B65D** *51/20*
U.S. Cl. 156—69 **7 Claims**

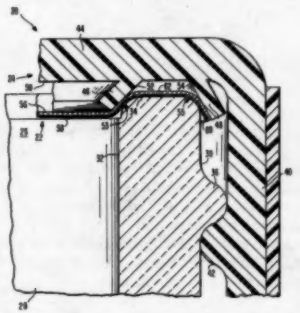
1. A process for forming a two part closure on a container having an open mouth defined by an upper, generally planar mouth rim that extends between inner and outer edges of spaced inner and outer neck walls, respectively, said process comprising:

forming a flexible foil sealing disk having a diameter slightly larger than the diameter of said container mouth and further having an annular skirt portion at its edge;

attaching said flexible foil sealing disk atop said container mouth and in engagement with said mouth rim and with said annular skirt portion of said flexible foil sealing disk overlying an upper portion of said outer neck wall of said container;

subsequently positioning a linerless closure cap having downwardly extending spaced inner and outer sealing flanges on said container mouth with said spaced inner and outer sealing flanges engaging an interposed peripheral portion of said flexible foil sealing disk, and with an inner surface of said downwardly extending outer sealing flange contacting said annular skirt portion of said flexible foil sealing disk and causing said annular skirt to contact said outer neck wall of said container, and with an outer surface of said downwardly extending inner sealing flange contacting said flexible foil sealing disk and causing said sealing disk to contact an upper portion of said inner neck wall of said container; and

securing said closure cap to said container and moving said spaced inner and outer sealing flanges downwardly along



said upper portions of said inner and outer neck walls, said downwardly moving outer sealing flange placing said annular skirt portion of said flexible foil sealing disk into tight sealing engagement with said outer neck wall, said downwardly moving inner sealing flange exerting a downward force on a central portion of said flexible foil sealing disk positioned within said container mouth and drawing said central portion of said flexible sealing disk within said container mouth taut, said spaced inner and outer sealing flanges further cooperating as they are moving downwardly to pull said peripheral portion of said flexible foil sealing disk overlying said mouth rim into intimate, positive sealing contact across said mouth rim and to draw said peripheral portion of said flexible sealing disk taut.

4,683,017

METHOD AND APPARATUS FOR FORMING A LOOP WITH END-GRIPPED STRAP

Janusz Figiel, Chicago; Donald Tremper, Mt. Prospect, and Peter Lems, Wilmette, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 25, 1985, Ser. No. 801,605
Int. Cl.[4] B32B *31/16*
U.S. Cl. 156—73.1 **26 Claims**

1. A method for forming a loop of strap for encompassing an article, said method comprising the steps of:

(a) feeding a length of strap to orient a segment between two spaced-apart gripping members;

(b) gripping said strap segment with said gripping members by effecting relative movement between said gripping members to a clamping orientation to clamp said strap segment between said gripping members;

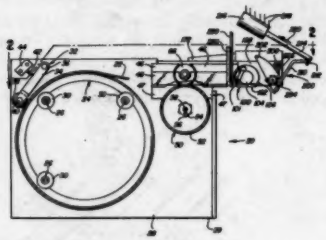
(c) while continuing step (b), moving both of said gripping members together in the clamping orientation in a closed path to form a primary loop in said strap around at least one of said gripping members; and

(d) while continuing step (b), feeding said strap to expand said primary loop to an expanded loop having a larger size for accommodating said article.

11. Apparatus for forming a loop of strap for encompassing an article with the loop, said apparatus comprising:

a frame and two gripping members mounted on said frame for movement together in a closed path;

means for effecting relative movement between said gripping members to a clamping orientation to clamp a segment of said strap between said gripping members;



means on said frame for moving said two gripping members together in said closed path, while fixed relative to each other in the clamping orientation with said strap segment clamped between said two gripping members, to form a primary loop in said strap around at least one of said gripping members; and

strap drive means for feeding said strap to expand said primary loop to an expanded loop having a larger size for accommodating said article.

4,683,018

COMPOSITE MATERIAL MANUFACTURE BY SHAPING INDIVIDUAL SHEETS FOLLOWED BY CONSOLIDATING THE SHEETS

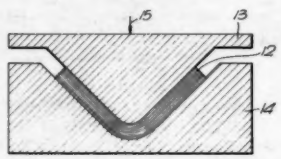
David T. Sutcliffe, and David J. Barraclough, both of Derby, England, assignors to Rolls-Royce plc, London, England

Filed Nov. 20, 1985, Ser. No. 799,861

Claims priority, application United Kingdom, Dec. 6, 1984, 8430891

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—196 **7 Claims**



1. A method of manufacturing a composite materials comprising the steps of stacking a plurality of alternate layers of uncured epoxy resin impregnated fibre and thin elastic release film, raising the temperature of said stacked layers to a level insufficient to cure said resin occurs, and applying sufficient pressure to said stack by opposed correspondingly shaped formers so that said stacked layers are deformed from a planar condition and move laterally with respect to one another and are formed into the shape defined by said correspondingly shaped formers, allowing said stacked layers to cool and subsequently discontinuing said applied pressure, separating said layers of said stack and removing said thin elastic release films therefrom, restacking said partially cured resin impregnated fibre layers on a former corresponding in shape therewith and applying sufficient pressure to said layers to fully consolidate them and at such a temperature and for such a time that the final curing of said resin occurs.

6. A method of manufacturing a composite material as claimed in claim 1 wherein said resin impregnated layers are tacked together after said re-stacking.

4,683,019

METHOD OF FORMING REFRACTORY COATING ON STEEL FRAME

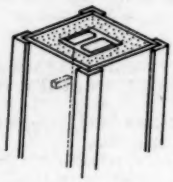
Hideo Motoki, Ibaraki, Japan, assignor to Shikoku Kaken Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP83/00425, § 371 Date Aug. 1, 1985, § 102(e) Date Aug. 1, 1985, PCT Pub. No. WO85/02430, PCT Pub. Date Jun. 6, 1985

PCT Filed Dec. 2, 1983, Ser. No. 768,534

Int. Cl.[4] E04B *1/94*

U.S. Cl. 156—293 **4 Claims**



1. A method for forming a refractory coating on a steel column or steel beam serving as a structural member of a building, the method comprising the steps of (1) adhering panels directly or indirectly to the surface of the steel column or steel beam with provision for a hollow space between the surface of the steel column or steel beam and the panels and (2) pouring a pasty self-hardening refractory composition into the hollow space in which the composition hardens into a layer integrally united with the panels and the steel column or steel beam, wherein the self-hardening refractory composition comprises:

(A) at least one water-soluble alkali silicate,

(B) a hardener for the water-soluble alkali silicate, and

(C) at least one material selected from the group consisting of a material containing bound water and a material capable of absorbing heat when heated.

4,683,020

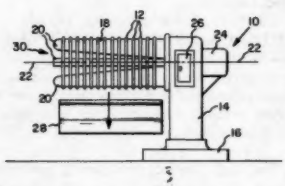
APPARATUS FOR STORING AND FEEDING TIRE BEADS

Steven J. Portalupi, Akron, and Robert S. Riggs, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 31, 1985, Ser. No. 761,181

Int. Cl.[4] B29D *30/08*; B65G *15/12*

U.S. Cl. 156—403 **11 Claims**



1. Apparatus for storing and feeding annular beads conveyed to said apparatus in a rack member which supports said beads in a separated condition comprising: (a) a conveyor assembly having a plurality of continuous conveyors positioned around a central axis and extending in an axial direction for positioning of said beads in said separated condition over said conveyor

assembly with radially inner surfaces of said beads placed around said conveyor assembly;

(b) means to move each of said conveyors radially outward of said central axis for urging each of said conveyors into gripping engagement with said beads to maintain said beads in said separated condition while said rack member is being removed; and

(c) means for driving all of said plurality of continuous conveyors simultaneously and intermittently toward the same end of said assembly to feed said beads one at a time to a transfer apparatus while maintaining the remainder of said beads in said separated condition.

4,683,021

TIRE BUILDING DRUM

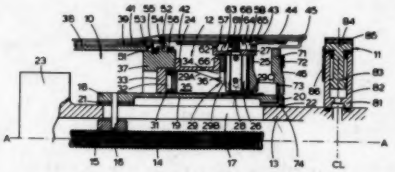
Joseph F. Stalter, deceased, late of Mogadore, Ohio (by Bernadette M. Stalter, executrix), and Gilbert M. Feller, Ingeldorf, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 4, 1985, Ser. No. 794,883

Claims priority, application European Pat. Off., Nov. 26, 1984, 84630178.6

Int. Cl.[4] B29D *30/24*

U.S. Cl. 156—415 **12 Claims**



1. A tire building drum having a center shaft, and a pair of end drum assemblies mounted axially slidable on the center shaft, each of said end drum assemblies comprises:

a sleeve mounted co-axially on the center shaft and slideable along the shaft,

an annular housing mounted on the sleeve and forming a co-axial annular chamber around the sleeve,

an annular expansion means mounted co-axially on the annular housing for radial movement relative to the sleeve,

an annular piston axially slideable in the co-axial annular chamber to effect a radially outward force and movement of the annular expansion means,

ramp means associated with the annular piston and engageable with the annular expansion means to move the annular expansion means radially of the sleeve in response to axial movement of the piston, said ramp means including a cam surface comprising two portions, an inclined radially outer portion, and a convex radially inner portion.

9. A tire building drum having a center shaft; a pair of co-axial end drum assemblies each mounted axially slidable on the center shaft for axial movement towards and away from each other, the end drum assemblies each providing a generally cylindrical surface for supporting a cylindrical tire carcass band, and including a radially expandable bead seating means; and annular inflatable bladders which when uninflated form substantially cylindrical tire building surfaces around the end drum assemblies,

said inflation bladders comprising an inside shoulder bladder adjacent to and extending axially inwards of the bead seating means, an outside shoulder bladder adjacent to and extending axially outwards of the bead seating means,

a first turn-up bladder also located adjacent the axially outer side of the bead seating means and completely enveloping the outside shoulder bladder,

and a second turn-up bladder located axially outside the first turn-up bladder, and when said bladders are uninflated lying radially inwardly of the first turn-up bladder.

4,683,022

AUTOMATIC DEVICE FOR PREPARING PAPER ROLLS FOR WEB PASTING

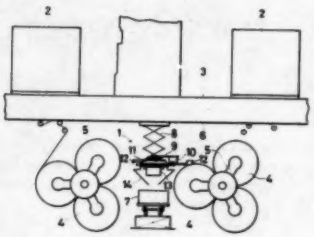
Takemi Watanabe, Toyonaka, and Noriyuki Shiba, Tokyo, both of Japan, assignors to Kabushiki Kaisha Kaneda Kikai Seisakusho, Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,298

Claims priority, application Japan, Apr. 26, 1985, 60-92074; Jun. 7, 1985, 60-86670[U]; Aug. 22, 1985, 60-128316[U]

Int. Cl.[4] B31F *5/06*; B65H *19/18*

U.S. Cl. 156—505 **7 Claims**



1. A device in a printing system for preparing paper rolls held on a reel stand for web pasting which comprises:

a folding support capable of being extended and folded vertically that supports in suspension the remainder of said device for preparing paper rolls for web pasting;

an arm held by said folding support, whose foremost end is capable of being moved in directions both parallel to and perpendicular to the axis of a paper roll on the reel stand;

a vacuum suction cup device held by said arm for lifting up the outermost web of the paper roll;

a cutter device held by said arm for cutting the outermost web of the paper roll;

an adhesive tape-attaching device held by said arm for adhesively attaching adhesive tapes for web pasting to the leading web end of the paper roll;

a table assembly positioned under said arm and held by said folding support;

a web edge fastening strip-attaching device positioned under said table assembly and held by said folding support for adhesively attaching one end portion of a fastening strip to the inner side of the leading web end of the paper roll; and,

a paper roll-pressing device for adhesively attaching the other end portion of said web edge fastening strip to the outer surface of the paper roll.

4,683,023

TAPE ATTACH MACHINE

Paul J. Sokolovsky, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 6, 1986, Ser. No. 836,941

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—518 **7 Claims**

1. An apparatus for applying adhesive material onto the end of a semiconductor device package, said apparatus comprising:

a punch assembly mounted to reciprocate along a straight horizontal line, said punch assembly including a shearing member and a shaft having a resilient tip;

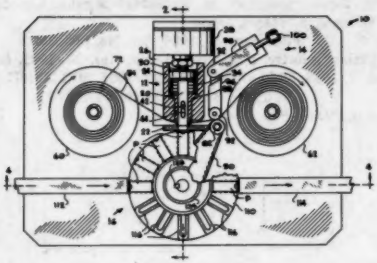
an inlet conveyor which moves the semiconductor device packages end-to-end;

a carousel which receives the packages singly from the inlet conveyor and rotates the packages into horizontal alignment with the punch;

an outlet conveyor which receives the packages singly and moves them end-to-end from the carousel;

a die having a port with dimensions sufficient to receive the shaft therethrough;

means for feeding a ribbon of adhesive material between the punch assembly and the die; and



means for reciprocating the punch assembly so that the shearing member contacts the die to cut the layer from the ribbon, and thereafter the shaft applies said layer to the end of the semiconductor device.

4,683,024

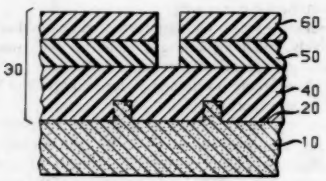
DEVICE FABRICATION METHOD USING SPIN-ON GLASS RESINS

David A. Miller, Seaside Park; Joseph M. Moran, Berkeley Heights, and Gary N. Taylor, Bridgewater, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 4, 1985, Ser. No. 697,645

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **7 Claims**



1. A method for fabricating a device, comprising the steps of:

forming a resist on a substrate surface, said resist comprising a first region overlying said substrate, a second region overlying said first region, and a patterned third region overlying said second region;

etching said second region with a second-region etchant while using said third region as an etch mask, said second-region etchant being produced by forming a plasma in a fluorine-containing gas;

removing said fluorine-containing gas, introducing a first-region etchant, and etching said first region with said first-region etchant while using said second region as an etch mask; and

completing the fabrication of said device, characterized in that

said forming step includes the step of spin-depositing said second region, said second region including material substantially resistant to lateral etching by fluorine-containing etchant species present during the etching of said first region, the composition and/or thickness of said second region being chosen so that said third region is substantially unaffected by exposure to said second-region etchant during the time requried to etch said second region with said second-region etchant, and the pattern etched into said third region is substantially identical to the pattern existing in said first region.

4,683,025

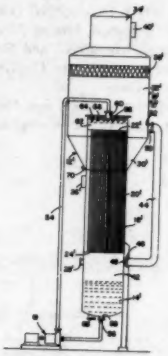
METHOD AND APPARATUS TO CONVERT A LONG TUBE VERTICAL EVAPORATOR TO A FALLING FILM EVAPORATOR

A. Roland Flores, Mountainside, N.J., assignor to The Graver Company, Union, N.J.

Filed Feb. 10, 1986, Ser. No. 828,226

Int. Cl.[4] B01D *1/22, 3/06*

U.S. Cl. 159—2.1 **10 Claims**



1. A method of converting a long tube vertical evaporator apparatus to a falling film evaporator apparatus wherein said long tube vertical evaporator apparatus includes a heat exchanger chamber having a plurality of heat exchange tubes positioned therein vertically extending between an upper tube sheet and a lower tube sheet, said heat exchanger chamber having a vapor inlet for directing vapor thereinto; a bottom chamber extending below said heat exchanger chamber in fluid communication with the lower ends of said heat exchange tubes, said bottom chamber having a feed inlet for directing feed liquid thereinto and upwardly through said heat exchange tube; and a vapor separation chamber positioned around and above an upper portion of said heat exchanger chamber in fluid communication with the upper ends of said heat exchange tubes, said vapor separation chamber having a vapor outlet at an upper portion thereof and a product outlet at a lower portion thereof; comprising the steps of:

(a) extending said bottom chamber so as to define a flash chamber intermediate said bottom chamber and said heat exchanger chamber and repositioning said feed inlet to feed liquid directly into said flash chamber into contact with falling liquid and vapor from the heat exchange tubes;

(b) establishing a pathway for directing vapor formed in said flash chamber into said vapor separation chamber through a vapor riser conduit having a first end connected to said flash chamber and a second end connected to said vapor separation chamber;

(c) establishing a pathway for recirculating liquid from said bottom chamber through a recirculation conduit having a first end connected to said bottom chamber and a second end connected to an upper portion of heat exchanger chamber and distributing same over the upper ends of said heat exchange tubes; and

(d) closing off said product outlet at said vapor separation chamber and establishing a product outlet in communication with said bottom chamber.

4. In an evaporator apparatus including a heat exchanger chamber having a plurality of heat exchange tubes positioned

therein which extend vertically between an upper tube sheet and a lower tube sheet, said heat exchanger chamber having a vapor inlet for directing vapor therein; and a vapor separation chamber positioned above said heat exchange chamber, said vapor separation chamber having a vapor outlet at an upper portion thereof; the improvement comprising: a flash chamber positioned directly below said lower tube sheet in fluid communication with said heat exchange tubes, said flash chamber having a feed inlet for directing feed liquid thereinto; a bottom chamber positioned below said flash chamber in fluid communication therewith; a vapor riser conduit positioned externally of said heat exchanger chamber having a first end in fluid communication with said flash chamber and a second end in fluid communication with said vapor separation chamber for directing vapor formed in said flash chamber therethrough and into said vapor separation chamber; and a recirculation conduit positioned externally of said heat exchanger chamber having a first end in fluid communication with said bottom chamber and a second end in fluid communication with a distribution chamber positioned directly above said upper tube sheet in fluid communication with said heat exchange tubes, said recirculation conduit having recirculation means for circulating liquid from said bottom chamber therethrough into said distribution chamber and downwardly through said heat exchange tubes.

4,683,026

THIN LAYER EVAPORATOR

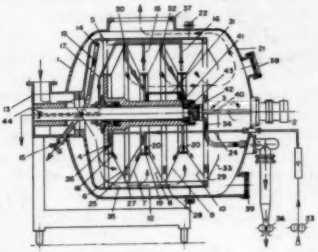
Vaclav Feres, Haid- und Neu-Str. 14, D-7500 Karlsruhe 1, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 732,166

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418982

Int. Cl.[4] B01D *1/22*

U.S. Cl. 159—6.1 **2 Claims**



1. In a thin layer evaporator having a container, a removable container cover, a drive shaft projecting into the container, a rotor fixed to the drive shaft and having a conical outwardly spreading evaporator surface defining an inwardly lying evaporator chamber, a heating chamber separated from the evaporator chamber, means for discharging liquid to be evaporated at the inner periphery of the conical evaporator surface of the rotor for spreading the liquid in a thin film outwardly therefrom over the conical surface toward the outer periphery of the evaporator surface and means including a draw-off pipe for removing the resulting concentrated liquid from the outer periphery of the evaporator surface, the improvement comprising: the removable container cover being disposed at the one side of the container and the drive shaft projecting into the container from the opposite side, a stationary hollow spindle (44) projecting into the container and the rotor (5) from said opposite side of the container, the drive shaft being formed in two parts, the first part (40) extending through the hollow spindle, and the second part including a hollow shaft (41) rotatably mounted on the outside of the hollow spindle and connected at one end with the first part (40) of the drive shaft within the spindle by means of an interconnecting flange (49) and at the other end (4) with the rotor whereby the container cover can be removed for inspection of the evaporator surfaces without structural disassembly of the rotor.

4,683,027

METHOD AND APPARATUS IN A PAPER MACHINE FOR REGULATING PRESSURE IN THE SPACE BETWEEN A HEADBOX LIP BEAM AND BREAST ROLL

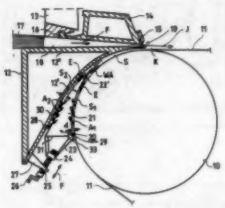
Kari Pitkäjärvi, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Oct. 24, 1985, Ser. No. 790,853

Claims priority, application Finland, Oct. 25, 1984, 844203

Int. Cl.[4] D21F *1/02*

U.S. Cl. 162—199 **17 Claims**



1. In a paper machine, a method for maintaining pressure induced in a wedge-shaped space at a desired level, the wedge-shaped space being defined between a wall of a headbox lip beam or the like and a breast roll over which a forming wire passes, comprising the steps of providing a blow box in the wedge-shaped space, the blow box including a curved side wall which substantially follows the contour of the breast roll and which defines a first gap space with the breast roll; and directing air or gas jets from the blow box through nozzle openings in said curved side wall into and through the first gap space in a direction opposite to a direction in which the forming wire moves on the breast roll so that by means of the air jets, air is ejected from the wedge-shaped space to maintain the pressure therein at a desired level.

7. In a paper machine including a headbox having a headbox lip beam, and a breast roll on which a forming wire passes, said breast roll and a wall of said headbox lip beam defining a wedge-shaped space between them, apparatus for maintaining the pressure induced in said wedge-shaped space at a desired level, comprising:

blow means situated in said wedge-shaped space for directing air or gas jets from: said wedge-shaped space in a direction opposite to a direction in which the forming wire moves on said breast roll, said blow means comprising a blow box including a curved first side wall which substantially follows the contour of the breast roll and which defines a first gap space with the breast roll, said first side wall having nozzle opening means formed therein through which said air jets are directed through said first gap space, whereby by means of the air jets, air is ejected from said wedge-shaped space to maintain the pressure therein at a desired level.

4,683,028

MOULDING

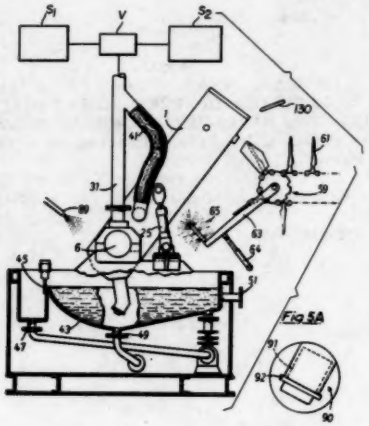
Martin Waller; Geoffrey Farrell, both of Bolton; Kenneth W. Mills, deceased, late of Freckleton; by Margaret Mason, executor, and by Geoffrey A. Shindler, executor, both of Manchester, all of England, assignors to Vernon and Company (Pulp Products) Limited, Lancashire, England

Filed Feb. 6, 1985, Ser. No. 698,888

Claims priority, application United Kingdom, Feb. 10, 1984, 8403507

Int. Cl.[4] D21J 7/00

U.S. Cl. 162—275 29 Claims



1. Apparatus for vacuum forming articles from a fibrous slurry the arrangement comprising:

a plurality of moulds, each mould formed by at least first and second mould members;

each mould comprising a fluid permeable member supported by part of each mould member and forming a moulding surface on said mould member defining the shape of the article to be vacuum formed;

a chamber in each mould member connected to the fluid permeable member;

a port in each mould member for application of suction to said chambers;

an inlet in each of said moulds for admitting fibrous slurry to be vacuum formed into the mould and onto the moulding surface;

means linking the mould members and controlling the opening and closing thereof in a non-linear manner;

transport apparatus movable in an endless path, said moulds being mounted on said transport apparatus;

suction means for applying suction to said moulds;

a slurry tank fo containing fibrous slurry;

conveying apparatus for receiving moulded articles from the moulds

means for opening said moulds to release the moulded articles onto conveyor apparatus;

means for closing the said mould members prior to conveyane to the slurry tank by said transport apparatus;

said conveyor apparatus comprising retaining pins which receive said moulded articles, said conveyor apparatus being movable in synchronism with said transport apparatus; and

means for oscillating said transport apparatus in synchronism with the movement of said moulds to position each mould in turn over a retaining pin and for displacing said mould relative to the retaining pin for onward movement towards the slurry tank.

4,683,029

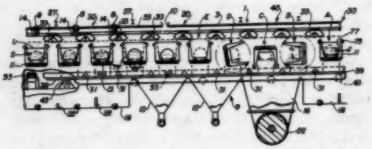
CIRCULAR SOLVENT EXTRACTOR

John F. Oyler, Pittsburgh; Jerry D. Brand, Aliquippa, and Richard Zavada, Pittsburgh, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Sep. 20, 1985, Ser. No. 778,545

Int. Cl.[4] B01D 11/02

U.S. Cl. 196—14.52 17 Claims



1. A circular solvent extractor apparatus suitable for processing a finely divided, abrasive feed stock material, such as tar sands and the like, said apparatus comprising:

circular trackway means;

continuous ring-shaped, inner and outer sidewalls positioned for travel on the circular trackway means, said inner and outer sidewalls having upper and lower edges and forming a continuous, annular chamber therebetween;

a plurality of spaced-apart structural spoke means extending between the inner and outer sidewalls to structurally interconnect the sidewalls for coupled travel;

motive means for moving the sidewalls about the circular trackway means;

stationary hood means positioned above the upper edges of the sidewalls;

a plurality of spaced-apart cells positioned within the annular chamber and each cell having a longitudinal axis extending along a radius of the circular solvent extractor apparatus, each cell having opposed inner and outer vertical end walls located adjacent the inner and outer sidewalls, respectively, vertical sides interconnecting the end walls and a liquid permeable bottom comprising a fine mesh screen element, said end walls, interconnecting vertical sides and bottom adapted to form a containment space for a bed of feed stock within each of said spaced-apart cells, and means for supporting the end walls of each cell onto a respective sidewall for coupled travel with the sidewalls;

stationery drain trough means positioned beneath the cells,

sealing means circumferentially coacting between the stationary hood means and the upper edges of the sidewalls and between the stationary drain trough means and the lower edges of the sidewalls to substantially seal the annular chamber from ambient atmosphere;

feed means extending through the stationary hood means in a feeding zone of said extractor apparatus for introducing feed stock material to be treated into the cells to form a contained bed of feed stock material within each of said cells;

solvent distribution means extending through the stationary hood means in a process zone of said extractor apparatus for introducing a liquid solvent into the cells to permit the solvent to percolate downwardly through each of the contained beds of feed stock material and exit the permeable cell bottoms with an extracted product removed from said feed stock material; and

said means for supporting the end walls of each of the cells includes means for rotating each cell about its longitudinal axis in a discharge zone of said extractor to invert the cells at least 180° and dump the treated beds of material therefrom and to return the dumped cells to an upright position prior to entry into said feeding zone.

4,683,030
METHOD FOR CARBONIZING COLD-COMPACTED BRIQUETTES

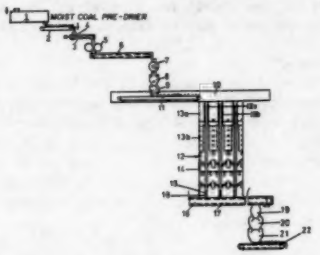
Heinrich Weber, Lenaustr. 2, 4350 Recklinghausen; Kurt Lorenz, Habichtstr. 65, 4320 Hattingen, and Horst Dungs, Am Dungelbruch 21, 4690 Herne, all of Fed. Rep. of Germany

Continuation of Ser. No. 458,278, Jan. 17, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,879

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202161

Int. Cl.⁴ C10B *47/18, 53/08, 57/02*

U.S. Cl. 201—6 **3 Claims**



1. A method of forming and carbonizing coldcompacted briquettes using a continuously operating preheater and a continuously operating indirectly heated vertical carbonization shaft oven having an upper vertical metal walled first stage for receiving a falling charge of briquettes, and spanning about one-half of the height of the shaft oven, an intermediate vertical ceramic material walled second stage for receiving the falling charge of briquettes from the first stage and a lower cooling stage for receiving the falling charge of briquettes from the second stage comprising:

grinding coal and/or peat material;

mixing the coal and/or peat material with binder to form a mixture;

cold-compacting the mixture to form briquettes;

pre-heating the briquettes in the continuously operating preheater to dry and harden the briquettes;

charging the dried and hardened briquettes into the first stage of the shaft oven;

indirectly heating the briquettes in the first stage of the shaft oven to an average temperature of about 480° to 500° C. by passing hot gases next to metal walls of the first stage on a side of the metal walls opposite from the briquettes to drive off substantially all volatile material from the briquettes in the first stage;

removing dust from the volatile material as it passes the metal walls of the first stage;

supplying the indirectly heated briquettes from the first stage to the second stage of the shaft oven;

indirectly heating the briquettes in the second stage to a temperature up to 1,000° C. by burning volatile material and air in the second stage to produce hot gases and passing the hot gases thus produced next to ceramic material walls of the second stage on a side of the ceramic walls opposite from the briquettes for carbonizing the briquettes in the second stage;

supplying the briquettes from the second stage to the cooling stage;

cooling the briquettes in the cooling stage;

discharging the volatile material expelled in the first stage at a temperature of about 280° to 350° C.;

heating the preheater using discharged hot gases from the first stage;

passing the volatile material from the briquettes in the first stage, through the metal walls of the first stage and past the hot gases in the first stage in a manner which isolates the volatile material from the hot gases;

supplying the volatile material with air to the second stage for forming the hot gases in the second stage;

supplying the hot gases from the second stage to form the hot gases of the first stage; and

removing gases expelled from the briquettes in the second stage mainly containing hydrogen in the cooling stage and partly circulating said gases containing hydrogen in the cooling stage for directly cooling the briquettes.

4,683,031
HOT COKE RECEIVING DEVICE

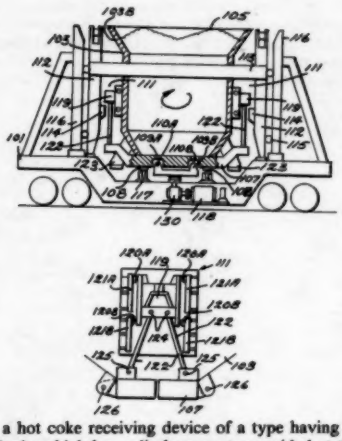
Shoji Kutsumura, Hokkaido, and Touichi Isonaga, Shiga, both of Japan, assignors to Nippon Steel Corp., Hokkaido and Fujicar Manu. Co. Ltd., Shiga, both of, Japan

Division of Ser. No. 653,768, Sep. 24, 1984. This application Mar. 13, 1986, Ser. No. 839,287

Claims priority, application Japan, Sep. 26, 1983, 58-148667; Jun. 1, 1984, 59-81779; Jun. 1, 1984, 59-81780; Aug. 17, 1984, 59-171293; Aug. 17, 1984, 59-171294

Int. Cl.⁴ C10B *39/12, 39/14*

U.S. Cl. 202—227 **3 Claims**



1. In a hot coke receiving device of a type having a coke bucket body which has a discharge gate provided at the bottom thereof, and having the coke bucket body turnably mounted on a bucket car, wherein the improvement comprises:

a ring-like horizontal frame surrounding the outer periphery of the coke bucket body without contact therebetween, said frame being connected to the discharge gate by means of a pair of rods and a pair of pins;

a pair of outwardly projecting trunnions disposed at opposing points on the said ring-like horizontal frame;

a support frame surrounding said coke bucket body, a pair of vertical hanger beams secured at opposing positions on said support frame near but spaced from the positions of said trunnions;

each said vertical beam having a projecting block which engages with a said trunnion when said hanger beams are moved vertically.

4,683,032
COKE OVEN DOORS FOR HORIZONTAL CHAMBER COKE OVENS

Wolfgang Becker, Herne, and Heinz Tewes, Gelsenkirchen-Buer, both of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 524,921, Aug. 19, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 708,097

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301877; Apr. 2, 1983, 3312072

Int. Cl.⁴ C10B *25/06, 25/16*

U.S. Cl. 202—248 **16 Claims**

1. A coke oven door in combination with a horizontal cham-

ber type coke oven having an oven chamber, said coke oven door comprising vertical door arrangement which comprises:

a door member to retain an oven filling inside said oven chamber, said door member having a sealing element;

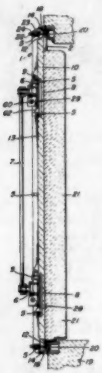
a door frame having an opening and a portion with a sealing surface, said door member having a closed position when abutting sad door frame, and an open position when away from said door frame;

said door member having a longitudinal axis;

a door stopper attached to the door member, said door stopper serving as a substantially heat insulating barrier and being disposed to protrude into the oven chamber sufficiently, to keep the oven filling at a predetermined distance from said door member in said closed position;

a separate force transmittal unit for transmitting force around said door member and for forcing said sealing element against said door frame in said closed position;

at least one connecting joint means being disposed for supporting said door member when said door member is moved to said open position, said at least one connecting joint means joining said door member and said force transmittal unit, said supporting being provided through said at least one connecting joint means, said at least one connecting joint means having a first element means and a second element means, said second element means being in a co-operative relationship and making contact with said first element means for supporting said door member in



said open position, said first element means being connected to be supported by said force transmittal unit when said door member is in said open position, said second element means being connected to support said door member when said door member is in said open position, said force transmittal unit having means for preventing said door member in said closed position from moving in a direction away from said door frame;

said sealing element having a portion which is disposed to make contact with said sealing surface of said door frame in said closed position;

locking means for providing bearing forces on said force transmittal unit at least to assist in sealing said sealing surface of said door frame with said sealing element of said door member;

said first element means and said second element means of said connecting joint means each having at least one surface directly facing at least one surface of the other element means;

said at least one facing surface of said first element means and said at least one facing surface of said second element means forming a gap therebetween along all parts of said facing surfaces such that said first element means and said second element means are non-touchingly disposed from one another in said closed position, whereby heat transfer between said first element means and said second element means because of said gap is minimized in said closed position; and

at least a portion of said at least one facing surface of said first element means making said contact, between said first and said second element means, with at least a portion of said at least one facing surface of said second element means when said door member is in said open position.

4,683,033

PURIFICATION OF IODINE-CONTAINING MIXTURES AND COMPOSITIONS USEFUL THEREFOR

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 749,361, Jun. 27, 1985, Pat. No. 4,599,472.
This application Jan. 24, 1986, Ser. No. 821,930
Int. Cl.[4] B01D *3/34*
U.S. Cl. 203—38 **6 Claims**

1. A process for the preparation by distillation of essentially colorless hydrocarbon product which is substantially free of color-forming impurities, which process comprises:

(a) adding 0.02 to 0.10 wt % of a metal, M, to a solution comprising:

(i) a hydrocarbon product having 8–30 carbon atoms, and

(ii) at least one color-forming impurity selected from the group consisting of:

I_2, and

R—I,

wherein R is H or an organic radical having 1–30 carbon atoms, inclusive; wherein said color-forming impurity and said metal interact under distillation conditions to form a complex, MI_n, wherein n is equal to the valence of the metal M, and wherein the complex MI_n is non-volatile and essentially non-decomposable under distillation conditions,

(b) subjecting the resulting mixture to distillation conditions, and thereafter

(c) recovering essentially colorless hydrocarbon product as the overhead fraction from said distillation.

4,683,034

PROCESS FOR SEPARATING DIMETHYL ISOPHTHALATE AND DIMETHYL ORTHOPHTHALATE FROM THEIR MIXTURE WITH DIMETHYL TEREPHTHALATE

Rolf Bader, Dietzenbach; Hartmut Last, Offenbach am Main; Manfred Mayer, Niedernhausen; Siegbert Rittner, Mörfelden-Walldorf, and Edgar Wetzel, Heusenstamm, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,767
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1984, 3430555
Int. Cl.[4] B01D *9/00*; **C07C** *67/52*
U.S. Cl. 203—43 **16 Claims**

1. A process for separating dimethyl isophthalate (DMI) and dimethyl orthophthalate (DMO) and other by-products from their mixture with dimethyl terephthalate (DMT), formed in the oxidation of p-xylene followed by esterification with methanol, which comprises:

(a) distilling the esterification product to obtain a solid DMT-rich fraction;

(b) recrystallizing the DMT-rich fraction obtained in step (a) from methanol to obtain crystalline DMT and mother liquor;

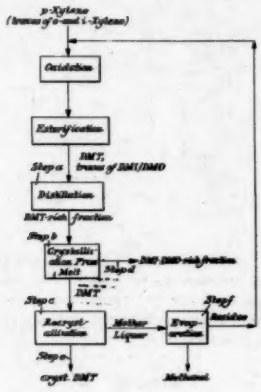
(c) recovering the crystalline DMT obtained in step (b);

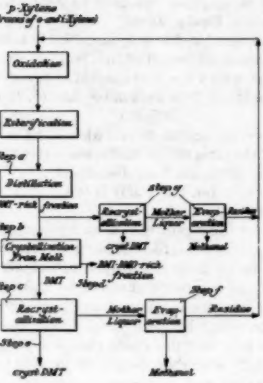
(d) evaporating the methanol from the mother liquor of step (b) to obtain a solid residue composed mainly of DMI, DMI and DMO;

(e) melting the residue obtained in step (d) and then cooling the resulting melt, without the DMT content in the melt

reaching the eutectic content to crystallize DMT, to obtain DMT and a DMI-DMO-rich fraction;

(f) recovering the DMT obtained in step (e); and





(g) at least partially removing the DMI-DMO-rich fraction, obtained in step (e).

4,683,035

METHOD FOR IN SITU CORROSION DETECTION USING ELECTROCHEMICALLY ACTIVE COMPOUNDS

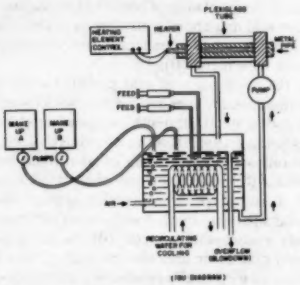
Barry E. Hunt, Aurora; Harvey M. Herro, Naperville, both of Ill.; Kyu-Hwa Lee, Kyungnam, Rep. of Korea, and Morris Mindick, Downers Grove, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 3, 1986, Ser. No. 825,703

Int. Cl.[4] G01N 27/46

U.S. Cl. 204—1 T **3 Claims**

1. A method for determining the corrosion rate of metals in contact with a liquid system which is capable of causing corrosion of such metals which comprises adding to the liquid system a soluble electrochemically active compound having a reduction potential more positive than the metal in contact with the liquid system and then monitoring the system thus treated with the electrochemically active compound by analytically detecting the soluble reduced form of the electrochemically active compound which was produced in situ and correlating the amount of the reduced form with the amount of corrosion.



4,683,036

METHOD FOR ELECTROPLATING NON-METALLIC SURFACES

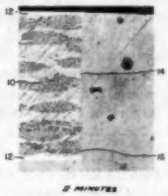
Denis M. Morrissey, Glen Cove; Peter E. Takach, Garden City South, and Rudolph J. Zeblisky, Hauppauge, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 501,167, Jun. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 394,442, Jul. 1, 1982, abandoned.

This application Nov. 21, 1985, Ser. No. 800,360

Int. Cl.[4] C25D 5/54

U.S. Cl. 204—15 **37 Claims**



1. A method for metallizing a non-metallic surface, without prior electroless metal plating, by electroplating the non-metallic surface in a vessel provided with a counter-electrode and containing an electroplating bath solution comprising in ionic form a metal (B) to be electroplated, said non-metallic surface being provided with a conductive connector area, said connector area being located outside of and abutting the non-metallic surface area to be electroplated, said abutting connector area being employed as an electrode during electroplating, characterized by the steps comprising:

(a) forming a plurality of discrete metallic sites on said non-metallic surface, each of said sites comprising metal (A), said metal (A) being different from said metal (B);

(b) exposing said non-metallic surface including at least a portion of said connector area to the electroplating bath solution, said solution having a defined conductivity and further comprising at least one component (C) which allows deposition of said metal (B) on said metallic sites comprising or consisting of metal (A), at a rate which is faster compared to the deposition rate of said metal (B) on surfaces consisting of, or formed by, the species of the electrodeposited metal (B), with the proviso that component (C) does not comprise pyrophosphate anion;

(c) applying a potential between the connector area and the counter-electrode which is sufficient to: (1) initiate elec-

troplating of metal (B) on the exposed portion of the connector area and (2) allow electroplating of metal (B) on neighboring metallic sites, the application of said potential initiating electroplating of metal (B) on the connector area and on said neighboring metallic sites, the electroplating of metal (B) on the connector area covering the connector area with metal (B);

(d) continuing the application of said potential until all of said neighboring metallic sites are covered with metal (B), the rate of forming metal (B) deposits on said neighboring metallic sites being greater than the electrodeposition rate of metal (B) on surfaces consisting of or formed by the species of metal (B), the greater rate of electrodeposition of metal (B) on said neighboring metallic sites continuing until all of said sites are covered with metal (B); and

(e) continuously electroplating metal (B) on the exposed portion of said connector area and on said electroplated sites to produce an electrically conductive continuous film of metal (B) having a thickness of at least 0.5 microns.

4,683,037

DIMENSIONALLY STABLE ANODE FOR MOLTEN SALT ELECTROWINNING AND METHOD OF ELECTROLYSIS

J. J. Duruz, Geneva, Switzerland, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Filed May 16, 1986, Ser. No. 864,057

Claims priority, application European Pat. Off., May 17, 1985, 85810235.3

Int. Cl.⁴ C25C *7/02, 3/12*

U.S. Cl. 204—64 R **14 Claims**

1. In an electrowinning cell having a substrate with a coating comprising an oxyfluoride of cerium providing enhanced resistivity against reducing as well as oxidizing cell environments up to temperatures of 1000° C. and higher, characterized by the coating further comprising at least one doping compound of an element selected from the group consisting of yttrium, lanthanum, praseodymium and other rare earth metals, the concentration of the doping compound(s) in the coating being less than 10 w % of the cerium constituents in the coating, the coating having a continuous coherent structure thereby providing a substantially impervious layer on the substrate.

4,683,038

PROCESS FOR PREPARING CERIC SULPHATE

Klaus H. Oehr, Surrey, Canada, assignor to B.C. Research Council, Vancouver, Canada

Continuation-in-part of Ser. No. 199,351, Oct. 21, 1980, Pat. No. 4,313,804. This application Nov. 13, 1981, Ser. No. 321,085

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.⁴ C25B *1/00*

U.S. Cl. 204—93 **7 Claims**

1. A process for preparing ceric sulphate in solution that comprises electrolyzing an at least saturated solution of cerous sulphate at an anodic current density in the range 100 to 400 mamp/cm^2, a cathode current density in the range 1000 to 4,500 mamp/cm^2 and with vigorous agitation in the presence of dilute sulphuric acid.

4,683,039

MEMBRANE PERVAPORATION PROCESS

Zbigniew Twardowski, Mississauga, and James D. McGilvery, Etobicoke, both of Canada, assignors to Tenneco Canada Inc. (ERCO division), Islington, Canada

Filed Dec. 24, 1985, Ser. No. 813,078

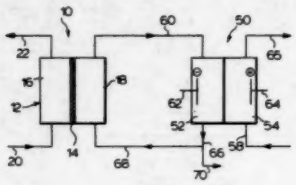
Int. Cl.⁴ C25B *1/26;* **C02F** *1/44*

U.S. Cl. 204—95 **15 Claims**

1. A method for the formation of an aqueous solution of chlorine dioxide, which comprises:

providing a donor medium comprising chlorine dioxide in a first chamber of a transfer zone having a gaseous chlorine dioxide-permeable and aqueous medium-impermeable membrane separating said first chamber from a second chamber in said transfer zone, and

providing a recipient aqueous medium in said second chamber and passing gaseous chlorine dioxide through the



membrane by pervaporation from said first chamber to said second chamber to be dissolved in said recipient aqueous medium while said membrane prevents the passage of aqueous medium between said first chamber and said second chamber.

4,683,040

PROCESS FOR ELECTROLYSIS OF SODIUM CHLORIDE

Masomi Seko, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 836,417, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 745,196, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 556,288, Mar., 1975, abandoned. This application Jul. 13, 1982, Ser. No. 397,783

Claims priority, application Japan, Mar. 7, 1974, 49-25718

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.⁴ C25B *1/14*

U.S. Cl. 204—98 **18 Claims**

1. A process for the electrolysis of an aqueous sodium chloride solution which comprises passing an electric current through said solution in an electrolytic cell separated into an anode chamber and a cathode chamber by a perfluorocarbon cation exchange membrane, while charging an aqueous sodium chloride solution which has been purified to a calcium content of less than 1 p.p.m. into the anode chamber, said membrane comprising a perfluorocarbon copolymer having pendant carboxylic acid groups, said membrane having an ion exchange capacity of carboxylic acid groups of from 0.5 to 2.1 milliequivalents per gram of dry resin.

4,683,041

PROCESS FOR ELECTROLYSIS OF SODIUM CHLORIDE

Masomi Seko, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 836,417, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 745,196, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 556,288, Mar. 7, 1975, abandoned. This application Jul. 13, 1982, Ser. No. 397,785

Claims priority, application Japan, Mar. 7, 1974, 49-25718

The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.

Int. Cl.⁴ C25B *1/14*

U.S. Cl. 204—98 **65 Claims**

1. A process for the electrolysis of an aqueous sodium chloride solution which comprises passing an electric current through said solution in an electrolytic cell separated into an anode chamber and a cathode chamber by a cation exchange membrane consisting essentially of perfluorocarbon polymer having pendant carboxylic acid and sulfonic acid groups, said membrane having an ion exchange capacity of sulfonic and

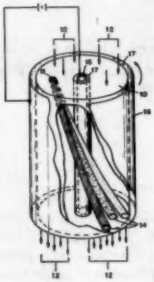
carboxylic acid groups of from 0.5 to 4.0 milliequivalents per gram of dry resin, the ion exchange capacity of the carboxylic acid groups being from 0.05 to 1.5 milliequivalents per gram of dry resin.

4,683,042

METHOD AND APPARATUS FOR CONTINUOUS ANNULAR ELECTROCHROMATOGRAPHY

Charles D. Scott, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 29, 1986, Ser. No. 857,228
Int. Cl.[4] G01N *27/26, 27/28*
U.S. Cl. 204—180.1 **16 Claims**



1. A method for separation of solutes in an aqueous sample, comprising the steps of:

(a) imposing an electrical potential gradient radially through a rotatable annulus comprised of an adsorbent material, said annulus having a first and a second end; then

(b) introducing, at a predetermined point at said first end of said annulus, a fluid sample comprising at least one separable constituent while continuously rotating said annulus, such that said predetermined point is stationary relative to the rotating annulus; and thereafter

(c) eluting said sample from said second end of said annulus such that said constituent is collected at said second end at a radial position $\bar{r}$ which is determined as a function of r_f, θ, V_e and ω, where

θ=angular displacement of said constituent in said annulus;

r_f=distance of said predetermined point from the center of said annulus;

V_e=electrophoretic mobility of said constituent in said adsorbent material; and

ω=rotational speed of said annulus.

4,683,043

CUBIC BORON NITRIDE PREPARATION

Carl W. Melton; Dale G. Thompson; Larry F. Vassamillet, and Charles E. Wickersham, all of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 21, 1986, Ser. No. 820,863
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.15 **8 Claims**

1. A method for deposition of cubic boron nitride on a substrate, which method comprises the steps of:

(a) supporting a substrate on an rf biased electrode in a near vacuum at a base pressure below approximately 30×10^{-6} torr whereby oxygen levels in deposited coatings are restricted to below 20 atomic percent,

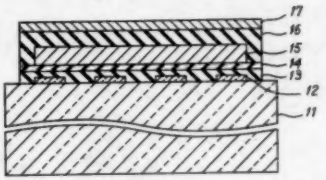
(b) heating the substrate to at least 130° C.,

(c) introducing a noble gas to a partial pressure not exceeding 20×10^{-3} torr,

(d) introducing nitrogen to a partial pressure not exceeding 5×10^{-3} torr,

(e) cathodically sputtering a BN source,

(f) during cathodic sputtering of the BN source, cathodically sputtering a metal dopant source consisting of a metal



selected from Groups IA, IVA, VA, VIIA, IB, IIB, IIIB, IVB, and VB of the periodic table such that dopant is deposited at less than 1.5 atomic percent,

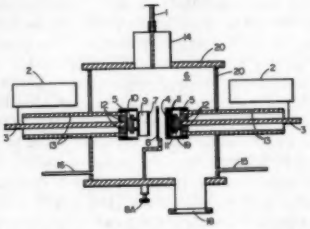
whereby a cubic boron nitride coating is deposited on the substrate.

4,683,044

METHOD OF MANUFACTURING AN ELECTROLUMINESCENT PANEL WITHOUT ANY ADVERSE INFLUENCE ON AN UNDERLYING LAYER

Yasumoto Shimizu, and Takeo Matsudaira, both of Tokyo, Japan, assignors to 501 Hoya Corporation, Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 879,050
Claims priority, application Japan, Jun. 26, 1985, 60-139894; Jun. 26, 1985, 60-140780
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192.26 **9 Claims**



1. A method of manufacturing an electroluminescent panel which comprises a transparent substrate, a transparent electrode member on said transparent substrate, a back electrode member opposite to said transparent electrode member, an electroluminescent layer between said transparent electrode member and said back electrode member, a first dielectric layer between said transparent electrode member and said electroluminescent layer, and a second dielectric layer between said electroluminescent layer and said back electrode member, preselected at least one of said first and said second dielectric layers being divisible into a first partial dielectric film near to said transparent electrode layer and a second partial dielectric film further from said transparent electrode layer than said first partial dielectric film, the method comprising the steps of:

preparing a pellet of a composition which essentially consists of silicon and oxygen;

depositing said first partial dielectric film in a nonoxidization atmosphere by the use of said pellet; and

depositing said second partial dielectric film on said first partial dielectric film to form said preselected one of the first and the second dielectric layers.

4,683,045

PARTIAL PLATING DEVICE

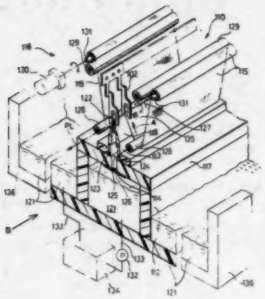
Yasuto Murata; Junichi Tezuka, both of Kanagawa, and Kenji Yamamoto, Tokyo, all of Japan, assignors to Electroplating Engineers of Japan, Limited, Tokyo, Japan

Filed Oct. 29, 1986, Ser. No. 924,657

Claims priority, application Japan, Dec. 16, 1985, 60-281217

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—206 **4 Claims**



1. In plating devices for electro-plating minute portions of plural connector terminals, **102** which are formed as a fork each on a continuous band-like member and each of which having a pair of target portions **104** to be plated that are opposing to each other by positioning a plating solution supply section located along the pass-line of the target portions and interposed therebetween and moving the connector terminals in contact with or in the vicinity of the plating solution supply section, a plating device characterized in that said plating solution supply section **111** includes a support member **113** which is shaped substantially like an arrowhead at its top portion **119** with slanted guide planes on both sides, has an opening **122** for allowing the plating solution to seep out at the tip **120** of the top portion and a passage **123** communicating with said opening for supplying the plating solution; an anode **126** which is disposed in or near the passage of the support; a net member **115** which covers the top portion of the support at its tip as well as the surface in the vicinity, can be wound up in the direction intersecting the pass-line and forms a plating solution supply section **127** at a location corresponding to said pass-line; and a winding means **116** which comprises guide rollers **128** for imparting tension to the net member so that the member comes in close contact with the top portion of the support at its tip as well as the surface in the vicinity and drive rollers **131** which wind up and pay out the net member freely.

4,683,046

REDUCTION POT FOR THE PRODUCTION OF ALUMINUM

Wilhelm Scharpey, Essen, Fed. Rep. of Germany, and Rudolf Pawlek, Sierre, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

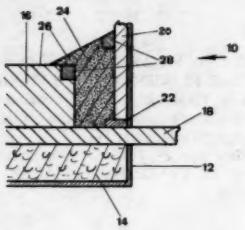
Filed Mar. 17, 1986, Ser. No. 840,594

Claims priority, application Switzerland, Mar. 22, 1985, 1275/85

Int. Cl.[4] C25C *3/08*

U.S. Cl. 204—243 R **6 Claims**

1. An aluminum reduction cell having an outer steel shell, thermal and electrical insulation, and an inner lining comprising at least a floor formed of a plurality of carbon blocks and sidewalls, the improvement which comprises a gap sealant at least in the region of the transition between the carbon blocks of the floor and the floor and sidewalls so as to prohibit penetration of the contents of the reduction cell into the inner lining of the reduction cell, the gap sealant comprises a pourable material characterized by a melting point of greater than 1000° C., a density of greater than 2.7 g/cm^3 and a high degree of resistance to molten electrolyte and molten aluminum.



4,683,047

BUSBAR ARRANGEMENT FOR ALUMINIUM ELECTROLYTIC CELLS

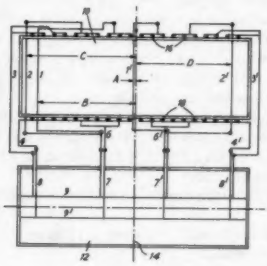
Richard F. Boivin, Quebec; Jean-Paul R. Huni, and Vinko Potocnik, both of Jonquiere, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Dec. 27, 1985, Ser. No. 814,207

Claims priority, application European Pat. Off., Dec. 28, 1984, 84309126.5

Int. Cl.[4] C25C *3/08, 3/16*

U.S. Cl. 204—243 M **9 Claims**



1. An asymmetric arrangement of busbars for conducting the electric current from collector bars spaced longitudinally of an aluminium electrolytic reduction cell, which cell is arranged transversely in a row of cells and in which cell a magnetic field is induced by one or more neighbouring rows of cells including a magnetically dominating row, to an anode beam of the next downstream cell, at least part of the current from upstream collector bar ends being carried by busbars extending underneath the cell to the downstream side thereof and any remaining current from the upstream collector bar ends being carried by busbars extending round the ends of the cell to the downstream side thereof,

wherein the busbars extending underneath the cell are arranged asymmetrically in relation to the transverse axis of the cell, at least one of such busbars being displaced longitudinally of the cell towards the end of the cell facing the magnetically dominating row, the extent of such displacement being such as to counteract the magnetic field induced in the cell by the neighbouring row or rows of cells.

4,683,048

METHOD OF MANUFACTURING ION SELECTIVE ELECTRODE PAIR

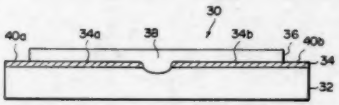
Sadao Yamada; Takeshi Takayama; Osamu Seshimoto, and Akira Yamaguchi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 16, 1985, Ser. No. 734,974

Claims priority, application Japan, May 18, 1984, 59-100317

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—416 **9 Claims**



1. A method of manufacturing an ion selective electrode pair comprising the steps of:

forming a conductive layer on an insulating base;

dividing said conductive layer into at least two portions electrically isolated from each other by simultaneously cutting and removing at least a part of the material of the conductive layer with a cutting tool selected from the group consisting of a slotter tool bit, a fluting tool bit and a cutting-off cutter to form a groove; and then

forming an ion selective layer on said conductive layer.

4,683,049

OXYGEN SENSOR ASSEMBLY

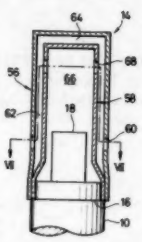
Toyohei Nakajima, Shiki, and Toshiyuki Mieno, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,469

Claims priority, application Japan, Jan. 26, 1985, 60-9827[U]

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—428 **2 Claims**



1. An oxygen sensor comprising:

(1) an oxygen sensing unit sensitive to oxygen in an oxygen-containing gas and operative to produce an output signal having a magnitude proportional to the concentration of oxygen in the oxygen-containing gas when contacted by a stream of the gas and having a sensor cell element made of a first active plate of an oxygen-ion conductive solid electrolyte and a first pair of electrodes sandwiching said active plate, a pump cell element made of a second active plate of an oxygen-ion conductive solid electrolyte and a second pair of electrodes sandiching said active plate, said first and second active plates confronting a restricted region into which said oxygen-containing gas is introduced and means for applying a pump voltage across said second pair of electrodes to obtain an electric signal having a magnitude related to said first pair of electrodes, said signal being said output signal, and

(2) a dual-shell housing structure having a longitudinal direction and comprising an outer shell and inner shell enclosed within the outer shell and spaced inwardly from the outer shell to form a first chamber between the outer and inner shells, said inner shell having defined therein a second chamber having said oxygen sensing unit fixedly held in position therewithin, said outer shell being formed with at least one port open to said first chamber and said inner shell being formed with at least one port open to the first and second chambers at a position spaced from said sensing unit in said longitudinal direction, the port in the inner shell being out of alignment with the port in the outer shell, the outer and inner shells having respective generally cylindrical wall portions radially spaced apart from each other to form a cylindrical gap portion therebetween and respective end walls axially spaced apart from each other to form therebetween an end gap portion merging into said generally cylindrical gap portion, the gap portions between the outer and inner shells constituting said first chamber, all the ports in said inner shell being located closer to a top end of the housing structure than all the ports in the outer shell and the oxygen sensing unit in said longitudinal direction of the housing structure.

4,683,050

MILD HYDROCRACKING WITH A CATALYST CONTAINING AN INTERMEDIATE PORE MOLECULAR SIEVE

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 711,452, Mar. 13, 1985, and a continuation-in-part of Ser. No. 715,510, Mar. 22, 1985, Pat. No. 4,600,493, each is a continuation-in-part of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271, and a continuation-in-part of Ser. No. 699,919, Feb. 8, 1985, Pat. No. 4,610,973, which is a continuation of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Aug. 22, 1985, Ser. No. 768,487

Int. Cl.[4] C10G *47/12, 47/20*

U.S. Cl. 208—110 **32 Claims**

1. A process for mild hydrocracking a hydrocarbon feedstock comprising contacting said feedstock containing feed components boiling above 700° F. under conditions of elevated temperature and pressure less than about 1,500 p.s.i.g. with a particulate catalyst comprising at least one active hydrogenation metal component selected from the group consisting of Group VIB and Group VIII metals in combination with (1) a dispersion of silica-alumina in a matrix consisting essentially of alumina and (2) a crystalline intermediate pore molecular sieve comprising a silicoaluminophosphate having a pore size between about 5 and 7 angstroms, said conditions yielding about a 10 to about a 50 volume percent conversion of said feed components boiling above 700° F. to product components boiling at or below 700° F.

25. A process for mild hydrocracking a hydrocarbon feedstock comprising said feedstock containing feed components boiling above 700° F. under conditions of elevated temperature and pressure less than about 1,500 p.s.i.g. with a particulate catalyst comprising at least one active hydrogenation metal component selected from the Group consisting of Group VIB and Group VIII metals in combination with (1) a dispersion of silica-alumina in a matrix consisting essentially of alumina and (2) an intermediate pore molecular sieve comprising a crystalline silica having a pore size between about 5 and 7 angstroms, said conditions yielding about a 10 to a 50 volume percent conversion of said feed components boiling above 700° F. to product components boiling at or below 700° F.

4,683,051

CATALYTIC CONVERSION WITH BORON TRIFLUORIDE TREATED ZEOLITE

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 787,943, Oct. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 701,313, Feb. 13, 1985, Pat. No. 4,567,310, which is a continuation-in-part of Ser. No. 526,764, Aug. 26, 1983, abandoned, which is a continuation of Ser. No. 355,419, Mar. 8, 1982, abandoned. This application May 6, 1986, Ser. No. 860,362

Int. Cl.[4] C10G *11/05, 45/64, 47/20*

U.S. Cl. 208—111 9 Claims

1. A process for dewaxing feedstock comprising hydrocarbon compounds to dewaxed conversion product which comprises contacting said feedstock with a catalyst composition comprising a crystalline zeolite having been modified by the method comprising contacting said zeolite having a silica-to-alumina mole ratio of from about 30 to about 300 and a Constraint Index of from about 1 to about 12 with gaseous boron trifluoride in the absence of alumina-containing binder and under a combination of conditions of temperature, contact time and pressure, said combination of conditions being effective to reduce the activity of the zeolite for cracking normal hexane as measured by the alpha test conducted at 538° C.

4,683,052

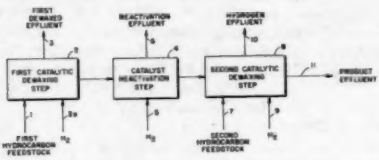
METHOD FOR NON-OXIDATIVE HYDROGEN REACTIVATION OF ZEOLITE DEWAXING CATALYSTS

Thomas F. Degnan, Jr., Yardley, Pa., and George R. Landolt, Audubon, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 743,463, Jun. 11, 1985, abandoned. This application Jan. 9, 1986, Ser. No. 817,372

Int. Cl.[4] B01J *29/38, 38/10;* C10G *45/62, 45/64*

U.S. Cl. 208—111 19 Claims



1. A method for non-oxidatively hydrogen reactivating a coked dewaxing catalyst comprising palladium, an inorganic oxide binder and a zeolite component having a constraint index ranging from about 1 to 12 and a silica to alumina molar ratio of at least about 12, which method comprises contacting said coked dewaxing catalyst with hydrogen at a hydrogen pressure less than about 7000 kPa (1000 psig), whereby maximum rate of coke removal from the catalyst is effected at less than 500° C.

4,683,053

HEMODIALYSIS DEVICE

Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,808

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416955

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—86 7 Claims

1. A hemodialysis apparatus comprising:

a dialyzer having a membrane, a first chamber, and a second chamber separated from said first chamber by said membrane, said first chamber for coupling into a dialyzing liquid path, and said second chamber for coupling into a blood path;

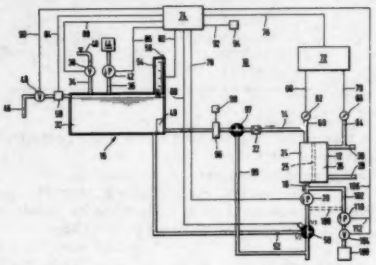
a dialyzing liquid source;

a suction pump disposed in the dialyzing liquid path downstream from the dialyzer for controlling transmembrane pressure in the dialyzer;

a restrictor means disposed in the dialyzing liquid path upstream of the dialyzer;

a changeover valve having a first outlet, a second outlet, and an inlet coupled to receive dialyzing liquid downstream from said suction pump;

a discharge port coupled to said first outlet;



volume-measuring means for measuring volume of ultrafiltrate liquid;

means for determining the transmembrane pressure in the dialyzer;

control means, said control means being coupled at least to the transmembrane pressure determining means for controlling the suction pump in response to transmembrane pressure; and

a return line coupled to said second outlet of said first changeover valve and connected to the dialyzing liquid source for returning the dialyzing liquid to the dialyzing liquid source in a closed circuit.

4,683,054

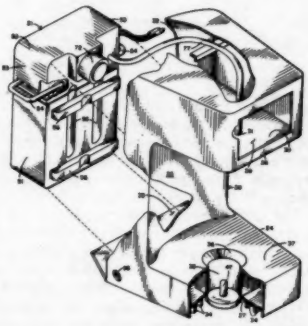
APPLIANCE FOR PURIFYING WATER

William E. Turnbull, 1920 Canyon Dr., Coeur d'Alene, Id. 83814

Filed Jun. 23, 1986, Ser. No. 877,497

Int. Cl.[4] C02F *9/00*

U.S. Cl. 210—91 7 Claims



1. A portable self-contained purifying appliance for potable water comprising, in combination:

a body having an elongate horizontal lower arm for support on a supporting surface with a vertical portion extending upwardly from one end thereof to support an upper arm extending perpendicularly to the upright and over the

lower arm at a spaced distance thereabove, said body having

means in the lower arm to carry a container support,

a chamber defined in the upright portion to releasably receive a purification cartridge, and

water input means to input water to a purification cartridge, including solenoid valve means to regulate the flow of input water;

a container support carrying a water container, said support having a medial depending support cylinder slidably carried for vertical motion within a channel defined in the lower arm, said container support being biased to an upper position and having a three position sensitive switch to sense the conditions of no container being supported, an unfilled container being supported, and a filled container being supported;

a purification cartridge releasably carried within the purification cartridge chamber defined in the body upright, said purification cartridge defining three adjacent, sequentially intercommunicating chambers, the said first chamber carrying a mechanical filter and a particulated carbon filter, the second chamber carrying an osmotic filter and the third chamber carrying a particulated carbon filter, and having means to pass water from the third cylinder to the container carried by the body structure; and means of removing saline water from the unfiltered side of the osmotic filter carried in said second chamber; and

associated electrical control circuitry to open the solenoid valve of the water input means only when a water container be in supported position on the container support and be not full, timing circuitry to determine the lapse of time of operation of the solenoid valve of the water input means and annunciate passage of a predetermined time, and circuitry to sense and annunciate the electric resistivity of water in the appliance to determine operational efficiency of the device.

4,683,055

FILTER FOR DIESEL FUEL

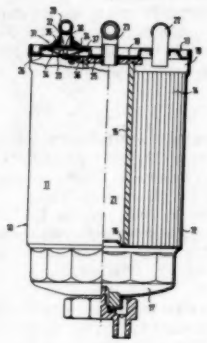
Franz-Ulrich Bosch, Stuttgart; Willi Müller, Sulz-Sigmarswangen; Hans Schacht, and Max Straubel, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 728,850

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3422979

Int. Cl.[4] B01D *27/08, 35/00*

U.S. Cl. 210—120 **9 Claims**



1. A conduit filter for diesel fuel to be mounted between a diesel fuel tank and a diesel fuel injection pump and comprising a housing accomodating a filter element; a first connection means and a second connection means, said first connection means being a feeding connection to the tank and said second connection means being a discharge connection connecte to the pump; means for temperature-responsive switching of heated fuel overflow quantities flowing from said pump to said tank; a third connection means receiving said overflow quantities into the filter; a fourth connection means for unloading the overflow quantities into the tank; said filter having an axis of elongation, said third and fourth connection means being positioned substantially in the same radial plane as said feeding connection and said discharge connection as viewed from said axis of elongation; ventilation means for carrying off gas inclusions from said overflow quantities being switched to the tank; a cover non-releasably connected to said housing and accommodating said first and second connection means, said housing being cupshaped, said temperature-responsive switching means and said ventilation means being integrated with said cover; a separating element rigidly connected to said housing and forming with said cover a chamber into which said third connection means and said fourth connection means extend; and a pressure control valve open to a contaminated side of the filter element and connecting said chamber to said contaminated side, said chamber accommodating said temperature-responsive switching means and said ventilation means, said separating element being positioned inside said housing, said third and fourth connection means being rigidly mounted immediately in said cover, said cover being made of relatively thin-walled material and being provided with a formation protruding and curved outwardly away from said housing and of substantially circular cross-section, said separating element being a flat cover plate enclosing with said formation said chamber, said temperature responsive switching means being a flow reversing valve including a movable control member formed by a flat bimetallic disc which is in connection with said third and fourth connection means, and a valve seat.

4,683,056

COLD TRAP APPARATUS

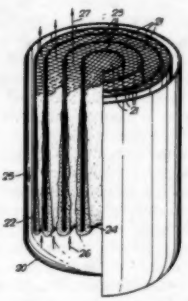
John Humphries, and Neil S. Morrison, both of Thurso, Scotland, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 10, 1984, Ser. No. 648,934

Claims priority, application United Kingdom, Sep. 28, 1983, 8325936

Int. Cl.[4] B01D *8/00*

U.S. Cl. 210—186 **9 Claims**



1. Cold trap apparatus for the purification of liquid metals, comprising a vessel through which liquid metal passes from an inlet to an outlet and which is subject to external cooling, in which the vessel includes means additional to the vessel for presenting extended surfaces across which the liquid metal is caused to flow in passing from the inlet to the outlet and in which impurities are precipitated, said additional means permitting flow from the inlet to the outlet without passing through filter means, in which said extended surfaces are presented by plural tubular enclosures open-ended at least at their

bottom ends along the surfaces of which the liquid metal flows, and in which said enclosures are nested within one another so as to provide annular gaps through which the liquid metal flows.

4,683,057

REFILLABLE FILTER-DRIER ASSEMBLY

Richard J. Krause, Addison; Zbigniew H. Gugala, Elmhurst, and Madhukant A. Shah, Wheaton, all of Ill., assignors to Henry Valve Company, Melrose Park, Ill.

Filed Mar. 8, 1985, Ser. No. 710,010
Int. Cl.[4] B01D *25/02*
U.S. Cl. 210—232 **6 Claims**

2. In a refillable filter-drier assembly for use in treating a refrigerant including an outer sleeve-like casing having end closures at least one of which is removable and one of said end closures having a liquid outlet nipple and said casing having a liquid inlet nipple adjacent the end thereof remote from said liquid outlet nipple and,

a replaceable core with a central bore comprised of at least one section and substantially coaxially disposed within said outer casing, said core being sufficiently smaller than the interior of said casing so as to provide an annular or sleeve-like liquid-receiving space therebetween, one end of said core being the end from which treated liquid discharges through said central bore and being axially supported adjacent said casing end closure having said outlet nipple and the opposite end of said core being axially supported adjacent the other of said end closures;

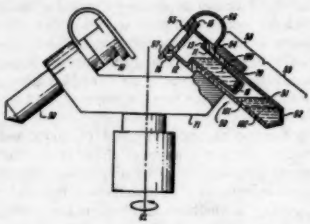
the combination with the foregoing of an annular end cage which fits over said one end of said core and which carries a filter screen which projects into the bore of said core, said annular end cage having a first plurality of laterally extending spacer lugs and a first plurality of core exterior gripping fingers projecting therefrom with the distal ends thereof having a second plurality of laterally extending spacer lugs, said first and second pluralities of spacer lugs serving to support the associated end of said core coaxially disposed in said outer casing; and an end closure cage fitting on said opposite end of said core and having a disc which fits against said opposite end of said core and closes the bore therein and having a second plurality of core exterior gripping fingers projecting from said disc, said disc having a third plurality of laterally extending spacer lugs and the distal ends of said second plurality of core exterior gripping fingers having a fourth plurality of of laterally extending spacer lugs, said third and fourth pluralities of lugs serving to support the associated end of said core coaxially disposed in said outer casing.

4,683,058

FILTER FOR CENTRIFUGE TUBE

George F. Lyman, Cape Porpoise, Me., and Gregory Mathus, Concord, Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Mar. 20, 1986, Ser. No. 841,583
Int. Cl.[4] B01D *21/36, 33/00*
U.S. Cl. 210—359 **14 Claims**



1. A filter assembly for filtering materials by means of centrifugal force, said assembly comprising:

a centrifuge tube comprising a cylindrical tube of a first length which is closed at a lower end and open at an upper end and including an upper portion adjacent the upper end and a lower portion adjacent the lower end, the centrifuge tube further including a flexible connecting member of a predetermined length and a cap, the connecting member being attached at one end to the centrifuge tube and at the other end to the cap;

a cylindrical filter tube of a second length less than the first length adapted to be fit in axial alignment within the upper portion of the centrifuge tube and to seal the open upper end of the centrifuge tube, the filter having an opening at its upper end;

the filter tube including a means for positioning the filter tube in a predetermined position within the upper portion of the centrifuge tube;

the connecting member being adapted to secure the filter tube in the predetermined position in the centrifuge tube while the cap seals the opening at the upper end of the filter tube; and

means for separating a predetermined amount of a mixture of permeable and nonpermeable materials placed in the filter tube when the composite assembly is spun in a centrifuge such that the nonpermeable materials are retained in the filter tube and the permeable materials which pass through the filter means are collected in the lower portion of the centrifuge tube including, filter means disposed at the lower end of the filter tube for separating permeable materials from nonpermeable material.

4,683,059

VACUUM BREAKER VALVE-DISCHARGE ELBOW ASSEMBLY FOR ROTARY DRUM FILTERS

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

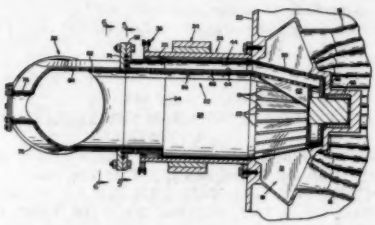
Filed May 24, 1985, Ser. No. 737,824
The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.
Int. Cl.[4] B01D *33/06*
U.S. Cl. 210—404 **30 Claims**

1. In a rotary drum filter of the type in which internal drainage pipes deliver filtrate from filtrate channels at the drum surface to chambers of an axial valve housing at one end of the drum, with the chambers of the valve housing delivering the filtrate into a stationary valve-discharge elbow assembly for discharge from the drum, all under the influence of suction applied from a remote source of subatmospheric pressure through said discharge elbow, said vlave-discharge elbow assembly comprising:

a valve member including an inlet end for insertion within the valve housing of a rotary drum filter and an outlet end, the valve member defining with rotary portions of the drum a filtrate flow passage,

a discharge elbow including an inlet end connected to the outlet end of said valve member and an outlet end, the discharge elbow defining a continuation of said filtrate flow passage, said continuation curving smoothly from the inlet end to the outlet end of the elbow,

the inlet end of the valve member including a valve end plug and a valve closure segment extending rearwardly of said plug for overlying a portion of the chambers of a valve



housing at any given time to block such portion from a source of subatmospheric pressure;

the outlet end of the valve member including an annular outlet portion connected to the discharge elbow and spaced from the valve segment,

and an extension segment extending rearwardly from the valve segment and interconnecting said valve segment and said annular outlet portion, whereby the cross sectional shape of the filtrate flow passage throughout at least a substantial portion of the length of the valve member is determined by said valve segment and said extension segment.

4,683,060

MULTIPLE-DISC TYPE FILTERS

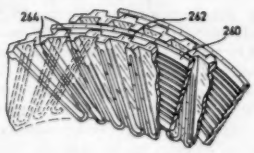
Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Mar. 7, 1985, Ser. No. 709,372

Claims priority, application Israel, Dec. 24, 1984, 73923

Int. Cl.[4] B01D *29/46*

U.S. Cl. 210—448 **24 Claims**



1. A filter including a housing having an inlet connectable to an upstream pipe, and an outlet connectable to a downstream pipe; and a stack of discs disposed within said housing for separating solid particles from a fluid flowing between said discs from the upstream side of said stack to the downstream side thereof; characterized in that said stack includes:

a plurality of co-operating filter elements defining a plurality of paired co-operating filter surfaces, including a plurality of filter discs each defining a large surface area formed with circumferentially directed grooves and a spacer disc interposed between each pair of adjacent filter discs, each spacer being structurally reinforced by periodically spaced generally radially extending lands formed in sinuous configuration on opposite sides thereof with oppositely tilted directions, said radial lands on a side of said spacer disc having radial grooves formed therein and contacting only a portion of said large surface area of said filter disc and leaving the portions of the large surface area on the upstream side of the stack between radial lands not contacted thereby, said radial grooves being repeatedly traversed by said circumferentially direced grooves at the areas at which said filter discs and spacer discs contact, thereby to form:

(a) compartments on the upstream side of the stack for accumulation of solid particles; and

(b) edge filtering passageways extending along the circumferentially directed grooves in contact with said spacer discs, which passageways define the minimum size of particles separated by the filter and extend from said compartments to the downstream side of the stack.

4,683,061

OUTLET FOR CYCLONE SEPARATORS

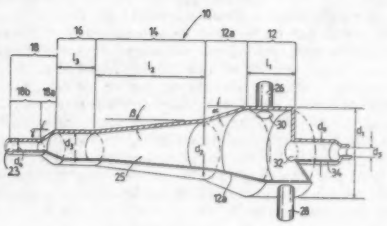
Noel Carroll, Sherbrooke Road, Sherbrooke 3789, Victoria, Australia

Continuation of Ser. No. 750,605, filed as PCT AU84/00164, Aug. 29, 1984, published as WO85/00990, Mar. 14, 1985, abondoned.

This application Dec. 17, 1986, Ser. No. 943,628

Int. Cl.[4] B04C *5/081*

U.S. Cl. 210—512.1 **9 Claims**



1. A cyclone separator comprising elements designed, sized and arranged for treating a mixture for separating a more dense liquid component from a less dense liquid component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet and an underflow outlet at the end of said separating chamber remote from said first cylindrical portion; wherein said overflow outlet has a diameter d_0, adjacent the separating chamber, in the range $0.0035 < d_0/d_1 < 1$ where d_1 is the diameter of the first cylindrical portion, said overflow outlet presenting a stepped bore with a first bore portion adjacent the first cylindrical portion being of greater diameter than a second bore portion thereof further form the first cylindrical portion wherein said stepped bore is characterised by the provision of a passageway extending sideways from the said first bore portion to the exterior of the separator, and including valve means selectively operable to permit flow from said passageway, said passageway facilitating clearing of blockages in the overflow outlet by supply of high pressure fluid therethrough.

4,683,062

METHOD OF CIRCULATION OF A LIQUID PHASE THROUGH A SOLID PHASE PARTICULARLY FOR BIOCATALYTICAL REACTIONS AND A DEVICE FOR REALIZATION THEREOF

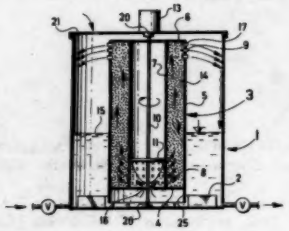
Premysl Krovak; Vladimir Behunek; Vladimir Vojtisek; Miroslav Salvet, and Pavel Hasal, all of Praque, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia

Filed Dec. 2, 1985, Ser. No. 803,815

Claims priority, application Czechoslovakia, Nov. 30, 1984, 9235-84; Jan. 23, 1985, 449-85

Int. Cl.[4] C02F 3/06; C12M 1/16, 1/18

U.S. Cl. 210—617 5 Claims



1. A method for the circulation of a liquid phase through a solid phase, comprising: rotating a part of the liquid phase so that centrifugal forces induce the rotating fluid to form at least a part of a rotating vertical liquid spindle, the spindle having an upper part, a lower part, and a central core, the central core of said spindle having the shape of at least a part of a liquid surface paraboloid, continuously supplying the lower part of said vertical liquid spindle with circulating liquid phase as a result of suction exerted by the rotating spindle, allowing said liquid phase to ascend along an upward-directed trajectory created inside the spindle to the upper part of said spindle, and allowing said liquid phase while ascending to also pass through a solid phase which is located along the upward-directed trajectory created inside said spindle, and allowing the liquid phase, after reaching the upper part of said spindle, to be drawn back into the liquid phase.

4,683,063

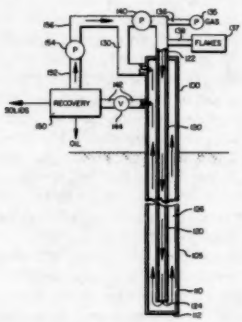
METHOD FOR CARRYING OUT EXTRACTIONS IN SUBTERRANEAN WELL

Wayne K. Rice, Wanatah, Ind., assignor to Vitamins, Inc., Chicago, Ill.

Filed May 8, 1985, Ser. No. 732,362

Int. Cl.[4] C02F 11/02

U.S. Cl. 210—634 8 Claims



1. A method of carrying out a high pressure extraction wherein the extracting solvent is a liquefiable fluid which comprises:

charging a subterranean well with said fluid;

circulating said fluid through said well;

injecting a material to be extracted into said fluid circulating through said well, said material containing a soluble substance to be extracted;

carrying said material to be extracted downwardly into said well for a distance sufficient to create a static pressure head and to elevate the total pressure to at least about 2,000 psi, and cause increased solubility of said soluble substance in said material to be extracted in said fluid;

carrying the resulting extracted residue and resulting extract upwardly in said solvent fluid; and

recovering said extracted residue and said extract from said well.

4,683,064

PROCESS FOR DECREASING THE NITRATE CONTENT IN WATER

Rolf O. Hallberg, Skolvägen 11A, S-13500 Tyresö, and Rudolf H. Martinell, Rågvägen 4A, S-18365 Täby, both of Sweden

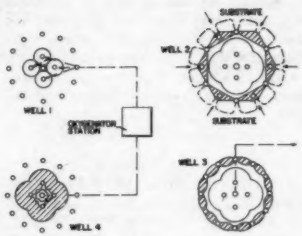
PCT No. PCT/SE84/00432, § 371 Date Jul. 9, 1985, § 102(e) Date Jul. 9, 1985, PCT Pub. No. WO85/03067, PCT Pub. Date Jul. 18, 1985

PCT Filed Dec. 17, 1984, Ser. No. 756,972

Claims priority, application Sweden, Jan. 16, 1984, 8400190

Int. Cl.[4] C02F 1/72

U.S. Cl. 210—605 2 Claims



1. In a process for decreasing the content of nitrate in ground water, which ground water can include infiltrated surface water, or surface water flowing through an aquifer or basin containing filter material, wherein treatment water containing denitrification organisms and/or substrate for such organisms is introduced intermittently through a number of injection wells or injection pipes arranged around an extraction well or extraction pipe for extracting purified water, the improvement which comprises, feeding said treatment water to some of the injection wells or injection pipes, while simultaneously drawing water from the remaining injection wells or injection pipes for the purpose of creating between the injection wells or injection pipes an annular denitrification zone spaced from the extraction well or extraction pipe, passing ground water through said denitrification zone and withdrawing said purified water from said extraction well or pipe.

4,683,065

METHOD FOR REDUCTION OF COD IN WATER

Morris Sheikh, 803 Canterberry Crescent, Bloomfield Hills, Mich. 48013

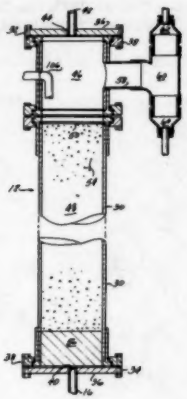
Filed Jun. 18, 1985, Ser. No. 746,041

Int. Cl.[4] C02F 1/72

U.S. Cl. 210—668 29 Claims

1. A method for reducing chemical oxygen demand (COD) levels in water containing chemical contaminants comprising the steps of:

(a) adding at least one oxygen source to the water;
(b) contacting the water with a first catalyst consisting of activated alumina;
(c) contacting the water from (b) with a catalyst selected from the group consisting of Group VIIIB metals, Group IB metals or mixtures thereof;



(d) reacting the chemical contaminants entrained in the water with the oxygen source in the presence of the first and second catalysts; and, then
(e) contacting the water with an adsorptive material to adsorb any chemical contaminants which remain in the water.

4,683,066

ANIONIC FLOCCULANT FOR DEWATERING STEEL MILL SLUDGES

Gerard R. Rose, Park Ridge; Ralph W. Kaesler, Schaumburg, and Dodd W. Fong, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 11, 1986, Ser. No. 884,833
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—734 **3 Claims**

1. A method of dewatering BOF aqueous scrubbing sludges which contain large amounts of finely divided iron oxides which comprises treating these sludges with a dewatering amount of an acrylamide acrylic acid, N-substituted lower alkyl acrylamide sulfonate terpolymer which contains from 35–80 mole percent of acrylamide, from 10–60 mole percent of acrylic acid and from 1–30 mole percent of the N-substituted lower alkyl acrylamide sulfonate the lower alkyl portion of which contains from 1–6 carbon atoms, which terpolymer has a reduced specific viscosity (RSV) of at least 25, and dewatering said sludges.

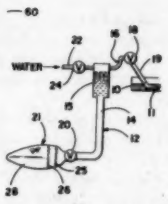
4,683,067

METHOD AND APPARATUS FOR CLEANING TOWER BASINS

Javier Aleman, 1146 Fourth St., Stone Mountain, Ga. 30083, and Kevin B. McBurney, 1470 Ashbrook Dr., Lawrenceville, Ga. 30245

Filed Aug. 30, 1985, Ser. No. 771,276
Int. Cl.[4] B01D *35/16, 35/28, 36/04*
U.S. Cl. 210—767 **12 Claims**

10. A method for cleaning the basin of a cooling tower having debris-containing sludge on the bottom of said basin, while cooling water is flowing into and out of said basin, said method including the steps of: placing a cleaning tool in said tower basin with the end of said cleaning tool beneath the level of the water in said basin; establishing a siphon to provide continuous suction on said cleaning tool, wherein said step of establishing a siphon includes the steps of filling with water to a point above the level of said water in said basin a reservoir disposed above the level of said water in said basin and a pipe means extending from said reservoir to a lower level below the level of said water in said basin, connecting said cleaning tool to a hose connected to said reservoir at a high level above said



level of water in said basin, and allowing the water to flow by gravity from said pipe means from a low level below said basin; moving said cleaning tool about said basin for utilizing said siphon to pick up and to remove said sludge from said tower basin by sucking in said sludge and some water from said basin without causing a substantial disturbance of said water; and continually replenishing the water in the basin.

4,683,068

FRACTURING OF SUBTERRANEAN FORMATIONS

Clare H. Kucera, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Continuation of Ser. No. 316,186, Oct. 29, 1981, abandoned. This application Oct. 20, 1984, Ser. No. 683,974
Int. Cl.[4] C09K *3/00*; E21B *43/26, 43/16*
U.S. Cl. 252—8.551 **22 Claims**

2. In the process for fracturing a subterranean formation penetrated by a wellbore which comprises introducing a hydraulic fracturing fluid into said formation at a flow rate and pressure sufficient to create, reopen and/or extend a fracture in said formation, the improvement comprising using an aqueous crosslinked gel as the hydraulic fracturing fluid which comprises an aqueous solvatable polysaccharide a plurality of vicinal hydroxy groups oriented sterically in a cis configuration and a molecular weight of at least about 100,000, and a crosslinking amount of a crosslinker composition consisting essentially of

(a) a product produced by reacting by contacting
  (i) a zirconium alkoxide corresponding to the formula $Zr(OR)_4$ wherein each R independently is an alkyl group of from 1 to about 4 carbon atoms or an inertly-substituted such alkyl group, with
  (ii) an alkanolamine corresponding to the formula $R'—N(CH_2—CH(OH)—R'')_2$, wherein
    (aa) R′ is hydrogen or $—CH_2—CH(OH)—R''$, and
    (bb) R′ is hydrogen, methyl of ethyl; said process being conducted in a liquid reaction medium under substantially anhydrous conditions and using a molar ratio of a:b of from about 1:2 to about 1:3, and
(b) a sufficient amount of water to render the product, (a), active as a crosslinker.

3. A process for fracturing a subterranean formation penetrated by a wellbore which comprises the step of:

(a) substantially continuously injecting
  (i) a crosslinking amount a crosslinker composition consisting essentially of a product produced by reacting by contacting
    (aa) a zirconium alkoxide corresponding to the formula $Zr(OR)_4$ wherein each R independently is an alkyl group of from 1 to about 4 carbon atoms or an inertly-substituted such alkyl group, with

(bb) an alkanolamine corresponding to the formula $R'—N(CH_2—CH(OH)—R'')_2$, wherein

(i) R' is hydrogen or $—CH_2—CH(OH)—R''$, and

(ii) R' is hydrogen, methyl or ethyl; said process being conducted in a liquid reaction medium under substantially anhydrous conditions and using a molar ratio of a:b of from about 1:2 to about 1:3, and

(ii) a sufficient amount of water to render the product, (i), active as a crosslinker, into

(iii) a flowing stream of an aqueous solvatable polysaccharide having a plurality of vicinal hydroxy groups oriented sterically in a cis configuration and a molecular weight of at least about 100,000 to thereby form a flowing crosslinkable fracturing fluid

(b) introducing said flowing crosslinkable fracturing fluid into the wellbore at a flow rate and pressure sufficient to permit said crosslinkable fracturing fluid to gel and increase in viscosity while it is passing through the borehole, and,

(c) introducing said aqueous gelled fracturing fluid into said formation at a flow rate and pressure at least sufficient to create, reopen and/or extend a fracture in said formation.

4,683,069

GLYCEROL ESTERS AS FUEL ECONOMY ADDITIVES

Phillip W. Brewster; Clinton R. Smith, and Frederick W. Gowland, all of Camlachie, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 260,987, May 6, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,935

Int. Cl.[4] C10M *137/10*

U.S. Cl. 252—32.7 E **4 Claims**

1. A lubricating oil composition formulated for use as a crankcase lubricating oil composition for gasoline or diesel engines consisting essentially of a major amount of a mineral oil of a lubricating viscosity which has incorporated therein (i) about 0.20 weight percent of a glycerol partial ester said partial ester being a mixture of glycerol monooleate and glycerol dioleate, said mixture having weight ratio of 3 parts of glycerol monooleate to 2 parts of glycerol dioleate said ester providing a fuel economy improvement of about 1 to 3 percent when said lubricating oil composition is employed in the crankcase of said engines, (ii) an ashless dispersant, (iii) a metal detergent additive (iv) a zinc dihydrocarbyl dithiophosphate anti-wear additive and (v) an antioxidant, said dispersant, detergent, anti-wear additive and antioxidant being present in conventional amounts to provide their normal attendant functions.

4,683,070

DETERMINATION OF METAL SOURCE IN USED OIL

Monroe W. Munsell, 180 Sutton Dr., Berkeley Heights, N.J. 07922, and Richard F. Finn, 64 Juniper Way, Basking Ridge, N.J. 07920

Filed Aug. 21, 1985, Ser. No. 767,744

Int. Cl.[4] C10M *135/10, 129/26*

U.S. Cl. 252—33.4 **24 Claims**

1. A method of forming a motor oil to facilitate determination of the source of a primary metal in said motor oil after use in a motor engine, wherein said primary metal originates both as a component added to said oil as an additive and as a result of motor engine part wear, which method comprises the addition to said motor oil of said primary metal additive and an oil soluble tracer metal additive the sole source of said tracer metal in said oil being said tracer metal additive, said tracer metal additive and said primary metal additive being added to said motor oil in a fixed predetermined ratio to thereby permit calculating from said ratio and the amount of tracer metal in said oil after use, the amount of said primary metal in said used oil due to wear.

4,683,071

BENZOTRIAZOLE MIXTURES, PROCESSES FOR PRODUCING THEM, AND THEIR USE AS METAL PASSIVATORS

Franz Regenass, Oristalstrasse 45, 4410 Liestal, and Peter C. Hamblin, Alemannenweg 12, 4112 Flüh, both of Switzerland

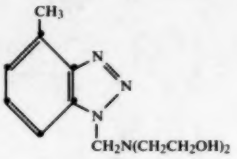
Continuation of Ser. No. 466,823, Feb. 16, 1983, abondoned. This application Oct. 18, 1985, Ser. No. 788,690

Claims priority, application Switzerland, Feb. 26, 1982, 1198/82

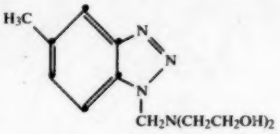
Int. Cl.[4] C07D *249/18;* **C10M** *133/44*

U.S. Cl. 252—49.3 **3 Claims**

1. A mixture of the compounds of the formulae I and II



(I)



(II)

consisting of 50 to 70 percent by weight of the compound of formula I and 50 to 30 percent by weight of the compound of formula II.

4,683,072

TWO-COMPONENT CLEANER AND DISINFECTANT TABLET

Bernd-Dieter Holdt, Duesseldorf; Ronald Menke, Mettmann; Gerd Praus, Krefeld, and Petra Hasselbach, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

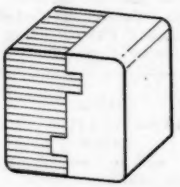
Continuation-in-part of Ser. No. 561,285, Dec. 14, 1983, Pat. No. 4,578,207, which is a continuation-in-part of Ser. No. 452,943, Dec. 27, 1982, abandoned. This application Nov. 12, 1985, Ser. No. 797,362

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225292

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—102 **11 Claims**



1. A two-component cleaning and disinfecting tablet for urinals and toilet flush tanks comprising extruded component A consisting essentially of (a) 10 to 50% by weight of an alkylbenzene sulfonate, (b) 10 to 40% by weight of inorganic alkali metal salts, (c) 5 to 10% by weight of at least one plasticizer, (d) 5 to 25% by weight of at least one disintegration rate regulator selected from the group consisting of fatty acid ethanolamides, fatty acid diethanolamides and stearic acid, (e) 5 to 50%

of disinfectant selected from an active oxygen containing peroxy compound, or acid and (f) 5 to 30% by weight of a complexing agent with the sum of (e) and (f) being greater than 5% by weight and extruded component B consisting essentially of (a') 20 to 55% by weight of an alkylbenzene sulfonate, (b') 15 to 45% by weight of inorganic alkali metal salts, (c') 2 to 10% by weight of at least one plasticizer, (d') 5 to 25% by weight of at least one distintegration rate regulator selected from the group consisting of fatty acid ethanolamides, fatty acid diethanolamides and stearic acid, (e') 1 to 10% by weight of perfume and (f') 5 to 15% by weight of dye, the sum of (c') and (e') being not greater than 10% by weight, components A and B being attached together and occupying different portions of the final tablet.

4,683,073

BUILDER FOR WASHING AGENTS

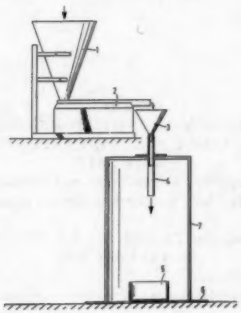
Manfred Diehl, Zeisselstrasse 7, D-6000 Frankfurt 1, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,056

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504450

Int. Cl.[4] C11D *7/14*

U.S. Cl. 252—135 **5 Claims**



1. A granulated washing agent builder consisting of 70 to 80 wt. % of a water insoluble silicate capable of binding calcium, the silicate being in the form of a finely divided, bound water containing, synthetically produced crystalline compound of the general formula

$$(Kat_{2/n}O)_x.Me_2O_3.(SiO_2)_y \quad (I),$$

in that Kat is a cation exchangeable with calcium and having the valence n, x is a number from 0.7 to 1.5, Me is boron or aluminum and y is a number from 0.8 to 6,

4 to 5 Wt.-% sodium sulfate

2 to 3 Wt.-% nonionic tenside

0 to 1 Wt.-% alkali

0.5 to 1 Wt.-% carboxymethylcellulose, methylcellulose or a mixture thereof

balance Water.

4,683,074

STABILITY AND COMPATIBILITY OF GLYCOSIDES IN ACID SYSTEMS

Arshad H. Malik, and Allen D. Urfer, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 26, 1985, Ser. No. 727,647

Int. Cl.[4] C11D *1/66, 7/08*; C23G *1/04, 1/12*

U.S. Cl. 252—136 **1 Claim**

1. An aqueous composition having a pH of 2 or less, the composition consisting of about 12.0 weight percent of an 85.0 weight percent aqueous solution phosphoric acid, about 3.0 weight percent oxalic acid, about 8.0 weight percent sodium nitrate, about 3.0 weight percent of an alkyl glucoside and about 74.0 weight percent water, the glucoside having a degree of polymerization of about 2.2, the alkyl glucoside having an alkyl group selected from the group consisting of nonyl, decyl, undecyl, dodecyl, tridecyl or mixtures thereof, the phosphoric acid, the oxalic acid, the sodium nitrate and alkyl glucoside dissolved in the water.

4,683,075

AZEOTROPE-LIKE COMPOSITIONS OF TRICHLOROTRIFLUOROETHANE, METHANOL, NITROMETHANE, ACETONE, AND METHYL ACETATE

David P. Wilson, Williamsville; Hang T. Pham, North Tonawanda; Earl A. E. Lund, West Seneca; Rajat S. Basu, Williamsville, and John W. Pelava, Kenmore, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 23, 1986, Ser. No. 888,668

Int. Cl.[4] C11D *7/50*

U.S. Cl. 252—171 **12 Claims**

1. Azeotrope-like compositions comprising trichlorotrifluoroethane, methanol, nitromethane, acetone and methyl acetate.

4,683,076

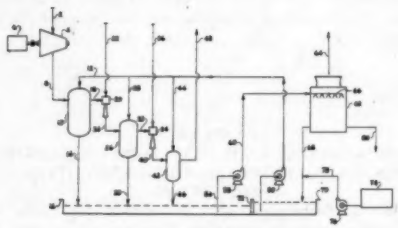
PROCESS FOR THE REMOVAL OF H_2S FROM GEOTHERMAL STEAM AND THE CONVERSION TO SULFUR USING FERRIC CHELATE AND CATIONIC POLYMER

Robert D. Lampton, Jr., and Thomas M. Hopkins, II, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 748,292, Jun. 24, 1985, Pat. No. 4,629,608. This application Apr. 4, 1986, Ser. No. 848,101

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—191 **7 Claims**



1. A composition comprising an aqueous solution containing sufficient soluble ferric chelate to give 3 to 15 percent iron and 0.5 to 10.0 percent by weight of one or more water soluble cationic polymeric catalysts.

4,683,077

REMOVAL OF SMALL AMOUNTS OF WATER FROM MOISTURE CONTAINING CARBOXYLIC ACIDS, ALCOHOLS, OR PHENOLS BY CONTACTING WITH A TETRASUBSTITUTED BICYCLIC AMIDE ACETAL

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

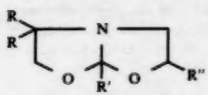
Continuation of Ser. No. 641,238, Aug. 16, 1984, Pat. No. 4,605,746. This application Feb. 10, 1986, Ser. No. 827,578

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—194 **9 Claims**

1. A process for removing small amounts of water from carboxylic acids, alcohols or phenols comprising contacting a moisture-containing mixture of carboxylic acid or phenol with

a tetrasubstituted bicyclic amide acetal conforming to the formula



wherein R represents a hydrocarbon group having from 1 to 10 carbon atoms, R′ represents a hydrocarbon group having from 1 to 20 carbon atoms, and R″ represents a hydrocarbon or ether group having from 1 to 20 carbon atoms and allowing the water and tetrasubstituted bicyclic amide acetal to react.

4,683,078

DIHALOGENO-AROMATIC COMPOUND

Shigeru Sugimori, Fujisawa; Yasuyuki Goto, and Tetsuya Ogawa, both of Yokohama, all of Japan, assignors to Chisso Corporation, Japan

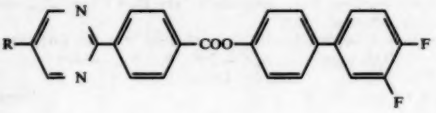
Filed Mar. 4, 1986, Ser. No. 836,126

Claims priority, application Japan, Mar. 12, 1985, 60-48548

Int. Cl.⁴ C09K *19/34, 19/30, 19/12;* **C07D** *239/02;* **C07C** *69/76, 69/74*

U.S. Cl. 252—299.61 **2 Claims**

1. A difluoro-aromatic compound expressed by the formula



wherein R represents an alkyl group or an alkoxy group, each of 1 to 12 carbon atoms, or an alkoxymethyl group of 2 to 12 carbon atoms.

4,683,079

LIQUID-CRYSTAL 4-N-PENTYLPHENYL ESTERS OF 4′-(TRANS-4″-N-ALKYLCYCLOHEX-2-ENOYLOXY)BENZOIC ACIDS

Vladimir S. Bezborodov, ulitsa Vasnetsova, 53; Viktor A. Konovalov, ulitsa Yakubova, 66, Korpus 4, kv. 26; Jury L. Ptashnikov, ulitsa Pushkina, 64, kv. 241; Vladimir M. Astafiev, ulitsa Malinina, 34, kv. 460, and Alexandr E. Petrovich, ultisa V. Khoruzhei, 46, korpus 1, kv. 55, all of Minsk, U.S.S.R.

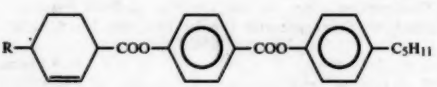
PCT No. PCT/SU84/00062, § 371 Date Jun. 20, 1986, § 102(e) Date Jun. 20, 1986, PCT Pub. No. WO86/02925, PCT Pub. Date May 22, 1986

PCT Filed Nov. 14, 1984, Ser. No. 885,574

Int. Cl.⁴ C09K *19/20, 19/06;* **C07C** *65/03, 65/105, 51/15*

U.S. Cl. 252—299.67 **1 Claim**

1. Liquid crystal 4-n-pentylphenyl esters of 4′-(trans-4″-n-alkylcyclohex-2-enoyloxy)benzoic acids of the general formula:



wherein R is C_2H_5, n—C_3H_7.

4,683,080

MICROBIOCIDAL COMPOSITIONS COMPRISING AN ARYL ALKANOL AND A MICROBIOCIDAL COMPOUND DISSOLVED THEREIN

Nuno M. Rei, Boxford, and Ronald C. Wilson, Wenham, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 619,092, Jun. 11, 1984. This application Apr. 22, 1985, Ser. No. 724,463

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.⁴ B01F *1/00;* **A01N** *55/02*

U.S. Cl. 252—364 **6 Claims**

1. A composition comprising a plasticizer suitable for use as a polymer processing aid, and from about 5% to about 20% by weight, based on the total weight of the composition, of a microbiocidal compound selected from the group consisting of phenoxarsines and phenarsazines, said microbiocidal compound being present as the solute in an aryl alkanol such that the weight ratio of the aryl alkanol solvent to microbiocidal compound is from about 3/1 to about 5/1.

4,683,081

AQUEOUS CORROSION INHIBITOR COMPOSITIONS OF A HALF-AMIDE AND A DICARBOXYLIC ACID AMINE SALT

Karl P. Kammann, Jr., Crown Point, and Kathleen A. Troxel, Griffith, both of Ind., assignors to Ferro Corporation, Cleveland, Ohio

Filed Jun. 27, 1986, Ser. No. 879,682

Int. Cl.⁴ C09K *3/00*

U.S. Cl. 252—392 **16 Claims**

1. A water-soluble, rust-preventative composition, comprising:

(a) a partial amide of an alkanolamine and an unsaturated dicarboxylic acid having from about 10 to about 36 carbon atoms;

(b) an aliphatic dicarboxylic acid, having from about 8 to about 20 carbon atoms; and

(c) at least one alkanolamine.

4,683,082

ONE-COMPONENT, PARTICLE-FILLED COMPOSITIONS

John E. Ehrreich, Acton, Mass., assignor to Ercon, Inc., Waltham, Mass.

Filed Mar. 27, 1985, Ser. No. 716,583

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—506 **23 Claims**

1. A filler composition useful in forming stable electroconductive compositions with organic resin binder systems wherein said filler composition is formed of an electroconductive powder of metal, carbon, or iron oxide, said powders are coated with a quantity of an organotin pacifier agent effective to impart good electroconductivity- and viscosity-stabilizing properties to said systems on aging.

4,683,083

MIXTURES OF TRICYCLO-DECANE-DERIVATIVES TOGETHER WITH THEIR PREPARATION AND USE ARE PERFUMING- AND FLAVORING MATERIALS

Ernst-Joachim Brunke, and Hartmut Struwe, both of Holzminden, Fed. Rep. of Germany, assignors to Dragoco Gerberding and Co. GmbH, Holzminden, Fed. Rep. of Germany

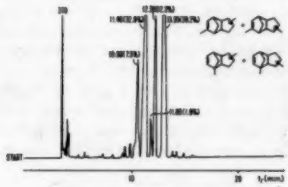
PCT No. PCT/EP84/00141, § 371 Date Jan. 10, 1985, § 102(e) Date Jan. 10, 1985, PCT Pub. No. WO84/04520, PCT Pub. Date Nov. 22, 1984

PCT Filed May 10, 1984, Ser. No. 691,567

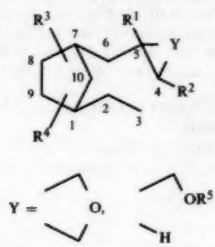
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317476

Int. Cl.[4] A61K *7/46;* C11B *9/0*

U.S. Cl. 252—522 R 10 Claims



1. A mixture of compounds of the formula:



wherein R^1 and R^2 are a methyl group or a hydrogen atom, one of the substituents being a methyl group and the other a hydrogen atom, R^3 and R^4 are a methyl group or a hydrogen atom, one of the substituents being a methyl group and the other a hydrogen atom, Y is a tetrahydrofurane system at C-4/C-5 or a substituted oxymethyl group at C-5 and a hydrogen atom at C-4, R^5 is a hydrogen atom or C_1–C_6-acyl-, C_1–C_6alkyl, C_1–C_6-alkenyl-, C_1–C_4 alkoxymethyl, C_1–C_2 alkoxycarbonyl-, formylmethyl-, or di-C_1–C_4 alkoxyethyl group and the broken lines indicate a C—C-single bond and a C—C-double bond and or two C—C-single bonds.

4,683,084

COMPOSITION COMPRISING A MATRIX RESIN, A FLAME RETARDING SYNERGIST, AND AN ALTERNATING COPOLYMER OF BROMINATED STYRENE AND N-BROMINATED PHENYL MALEIMIDE

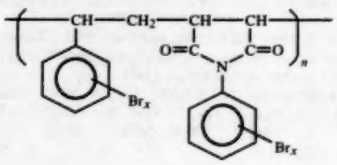
Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 668,458, Nov. 5, 1984, Pat. No. 4,607,081, which is a division of Ser. No. 489,668, Apr. 28, 1983, Pat. No. 4,508,883. This application Feb. 3, 1986, Ser. No. 825,502

Int. Cl.[4] C09K *21/00;* C08F *214/16;* C08L *39/04*

U.S. Cl. 252—609 3 Claims

1. A moldable composition comprising a matrix resin, a flame retarding synergist, and an alternating copolymer having the following general formula:



wherein each x separately represents an integer of from 1 to 5 and n represents an integer of from 10 to 2000, the alternating copolymer being present in an amount sufficient to improve the flame retarding characteristics of the matrix resin.

4,683,085

POLYAZIDO ESTERS

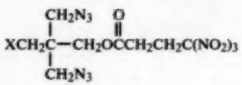
Milton B. Frankel, Tarzana, and Edgar R. Wilson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 19, 1985, Ser. No. 766,459

Int. Cl.[4] C07C *117/00*

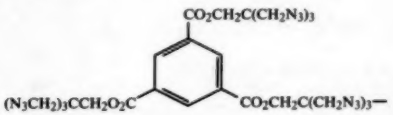
U.S. Cl. 260—349 2 Claims

1. A polyazido monoester having the general formula:



wherein X is N_3 or ONO_2.

2. A polyazido triester having the formula:



4,683,086

AZIDO DERIVATIVES OF PENTAERYTHRITOL

Milton B. Frankel, Tarzana, and Edgar R. Wilson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 19, 1985, Ser. No. 766,460

Int. Cl.[4] C07C *117/00*

U.S. Cl. 260—349 9 Claims

1. An azido derivative of pentearythritol having the general structural formula:

wherein Y is selected from the group consisting of halogen, ONO_2 and N_3, and Z is selected from the group consisting of OH and ONO_2.

4,683,087

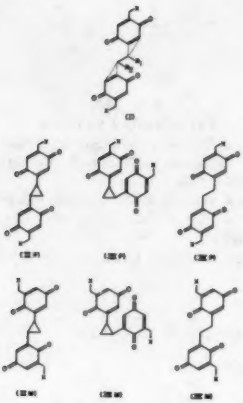
ANTI-CANCER AGENTS AND PROCESSES FOR THEIR PREPARATION

Donald T. Witiak, Mt. Vernon, and Ronald M. Glaser, Powell, both of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

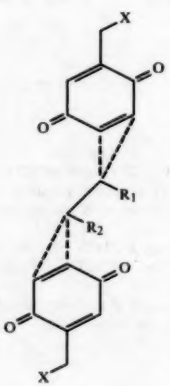
Continuation of Ser. No. 526,895, Aug. 26, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 725,167

Int. Cl.[4] C07C *50/08, 50/06*

U.S. Cl. 260—396 R 6 Claims



1. A compound of the formula



wherein R_1 and R_2 are each a hydrogen atom or R_1 and R_2 together form a methylene group, each X is a bromo, iodo or tosyloxy group and the dotted bonds indicate that the central $—CHR_1—CHR_2—$ linkage is attached to the two phenyl rings at positions which are either meta to both CH_2X groups or para to both CH_2X groups.

4,683,088

NICKEL/ALUMINA/SILICATE CATALYST, ITS PREPARATION AND USE

Johannes C. Oudejans, Delft; Peter Nootenboom, Oud-Beyerland; Keshab L. Ganguli, Bleiswijk, and Cornelis M. Lok, Rockanje, all of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" BV, Rotterdam, Netherlands

Division of Ser. No. 747,439, Jun. 21, 1985, Pat. No. 4,631,265. This application Sep. 17, 1986, Ser. No. 908,211

Claims priority, application Netherlands, Jun. 21, 1984, 8401965

Int. Cl.[4] B01J *21/12, 23/74;* C11C *3/12;* C07C *85/12*

U.S. Cl. 260—409 1 Claim

1. In a process for the catalytic hydrogenation of an unsaturated organic compound selected from the group consisting of oils, fats, fatty acids and fatty nitriles, the improvement which comprises utilizing as the catalyst, a nickel/alumina/silicate catalyst in which the atomic ratio of nickel/aluminium is between 20 and 5, the nickel/silicate molar ratio between 20 and 4.5 and the active nickel surface area is between 70 and 150 m^2/g nickel, said catalyst having an open porous structure with macropores of 50–500 nanometers and a mesopore structure having an average pore size between 8 and 20 nanometers.

4,683,089

CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Thomas Leigh, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 18, 1979, Ser. No. 86,036

Claims priority, application United Kingdom, Oct. 27, 1978, 42266/78

Int. Cl.[4] C07C *61/04*

U.S. Cl. 260—501.16 2 Claims

1. The 1-α-methylbenzylamine salt of (+)-cis-3-(2-chloro-3,3,3-trifluoroprop-1-en-1yl)-2,2-dimethylcyclopropane carboxylic acid.

4,683,090

PURIFICATION OF ORGANOSULFONYL HALIDES

Roger T. Clark, Pottstown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 25, 1982, Ser. No. 436,494

Int. Cl.[4] C07C *143/70*

U.S. Cl. 260—543 R 4 Claims

1. A method for the purification of a liquid organosulfonyl chloride, said liquid organosulfonyl chloride having the formula RSO_2Cl wherein R is an alkyl group having from 1 to 6 carbon atoms and containing an inorganic compound of iron or copper as a contaminant, comprising passing said liquid organosulfonyl chloride through a bed of activated carbon whereby the amount of said contaminant in the liquid chloride is reduced.

4,683,091

PROCESS FOR THE NUCLEOPHILIC SUBSTITUTION OF UNACTIVATED AROMATIC AND HETEROAROMATIC SUBSTRATES

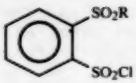
Alden D. Josey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 481,874, Apr. 11, 1983, which is a continuation-in-part of Ser. No. 378,993, May 17, 1982. This application Sep. 9, 1985, Ser. No. 773,633

Int. Cl.[4] C07C *143/70, 149/32*

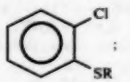
U.S. Cl. 260—543 R 8 Claims

1. A process for preparing a sulfonyl chloride of the formula:

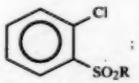


where R is lower alkyl, comprising

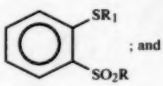
(a) contacting ortho-dichlorobenzene with an anionic nucleophile in the form of a salt of the formula M^+SR^- where M is an alkali metal in the presence of an acyclic polyethyleneglycol catalyst to produce the compound



(b) oxidizing the product of step (a) to produce the compound

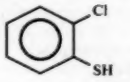


(c) contacting the product of step (b) with a salt of the formula $M^+SR_1^-$ where M is an alkali metal and R_1 is lower alkyl to produce the compound



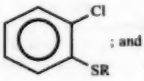
(d) chlorinating the product of step (c) in the presence of water to prepare the desired sulfonyl chloride.

6. A process for preparing a thiophenol of the formula



comprising

(a) contacting ortho-dichlorobenzene with an anionic nucleophile in the form of a salt of the formula M^+SR^- where R is a secondary or tertiary lower alkyl and M is an alkali metal in the presence of an acyclic polyethyleneglycol catalyst to produce the compound



(b) heating the product of step (a) with a strong acid.

4,683,092

CAPSULE LOADING TECHNIQUE

Wen-Ghih Tsang, Lexington, Mass., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Filed Jul. 3, 1985, Ser. No. 752,384

Int. Cl.[4] A61K *9/36, 9/38, 9/52;* **B01J** *13/02*

U.S. Cl. 264—4.3 **23 Claims**

1. A composition of matter comprising a previously formed, and deflated, dehydrated cpsule having an intact, selectively permeable membrane defining a substantially empty interior volume, said membrane being expandable upon rehydration with a solute and aqueous solution at a given concentration to produce a capsule containing said solution and capable of sustained release of said solute.

4,683,093

METHOD FOR HOLDING A MOVING FILM

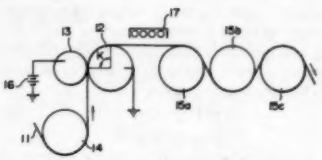
Satoru Hagiwara; Kimio Satoh, both of Otsu, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,457

Claims priority, application Japan, Nov. 6, 1984, 59-232467

Int. Cl.[4] B29C *55/06*

U.S. Cl. 264—22 **16 Claims**



1. A method for holding a moving film comprising the steps of:

bringing each surface of at least one set of conductive rolls having conductive surfaces into contact with a front surface and a back surface of a moving film respectively, at least one of the surfaces of said set of rolls being constructed of a conductive elastomer; and

holding said moving film by said surfaces of said rolls while establishing a high electric potential difference between said surfaces of said rolls.

4,683,094

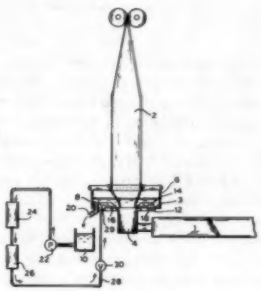
PROCESS FOR PRODUCING ORIENTED POLYOLEFIN FILMS WITH ENHANCED PHYSICAL PROPERTIES

Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,948

Int. Cl.[4] B29C *47/02, 47/90*

U.S. Cl. 264—38 **2 Claims**



1. In a method for the production of polyethylene film by extruding molten film upwardly from an annular die in a tubular form into an extrusion zone, the improvement for providing enhanced physical properties by controlling crystalline growth comprising:

providing a water liquid quench medium maintained at a constant temperature range of from about 150° to about 200° F. in said extrusion zone immediately adjacent the

annular orifice of said annular die, said temperature range being maintained by continually circulating said liquid quench medium through heating and cooling means and thence to said extrusion zone whereby the temperature of said medium is continually adjusted to said temperature range, said liquid quench medium provided on the exterior of said tubular form at a depth maintained at from about 0.25 inches to about 1.00 inches, and said liquid quench medium being circulated through said extrusion zone at a throughput rate of from about 1.5 to about 5.0 parts by weight of liquid per part of polyethylene film throughput for maintaining a maximum temperature difference between liquid medium inlet and outlet of not more than about 5° F., said liquid quench medium including coating material for depositing on said polyethylene film,

extruding said molten film at a thickness of from about 0.5 mils to about 3 mils directly into said liquid quench medium over an internal mandrel, and

orienting said quenched polyethylene film in a tubular bubble, whereby said polyethylene film is quenched with controlled crystalline growth.

4,683,095

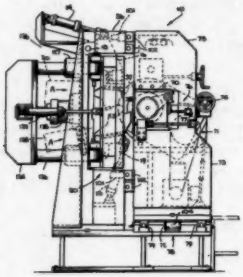
EARLY PROGRESSIVE JUNCTION EXTRUSION PROCESS AND SYSTEM

Eric Tolonen, Gladwin, Mich.; Clifford J. Tubbe, Kitchener, Canada; George G. Giesbrecht, Kitchener, Canada, and John A. Wiens, Kitchener, Canada, assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed May 8, 1985, Ser. No. 732,196

Int. Cl.[4] B29C *47/06, 47/32*

U.S. Cl. 264—171 **13 Claims**



1. Apparatus for forming an elastomeric strip comprising a roller; a final die confronting and in spaced relation convering toward said roller, said final die and roller cooperatively defining a final chamber terminating in a restriction orifice; extrusion means for advancing a two or more elastomeric materials under pressure toward said final chamber; a head assembly and a preform die in serial flow relationship positioned between said extrusion means and said final die; flow chambers formed within said head assembly and said preform die for intercommunicating said extrusion means and said final chamber, said head assembly flow chambers originating at the interface of said head assembly with said extruder means and continuing into said preform die, said preform die flow chambers converging to at least one common junction within said preform multi-material flow having a desired amount of each of two or more elastomeric materials is established within said preform die, and said preform die exist chamber communicating with said final chamber where said multi-material flow is finally shaped and deposited as an elastomeric strip onto said roller without altering the relative amounts of each elastomeric material.

11. A method of forming an elastomeric strip comprising the steps of:

a. extruding two or more elastomeric materials under pressure into separate flow chambers within a head assembly;

b. progressively converging said elastomeric materials together at a common junction in a preform die to form a single multi-material flow within a preform die exit chamber;

c. directing said multi-material flow in said preform die exit chamber into a final chamber formed between a final die and a rotating roller; and

d. finally extruding said elastomeric strip through a restriction orifice onto said roller.

4,683,096

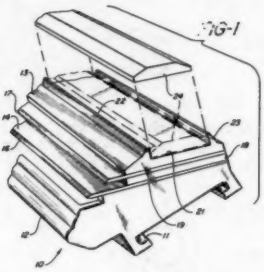
METHOD OF SECURING A SHAVING AID TO A RAZOR CARTRIDGE

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 31, 1986, Ser. No. 824,498

Int. Cl.[4] B29C *65/00*

U.S. Cl. 264—249 **3 Claims**



1. Method of securing a solid shaving aid having outwardly facing tapered longitudinal edges to a razor cartridge where the cartridge is fabricated of a deformable plastic material comprising the steps of:

(a) forming a recess in a face-engaging surface of the cartridge parallel to a cutting edge of the blade;

(b) providing deformable fins along the margins of said recess parallel to a cutting edge of the blade;

(c) depositing the shaving aid with said tapered edges facing outwardly and parallel to the cutting edge of said blade into said recess; and

(d) thereafter deforming the fins over said tapered edges to an extent sufficient to retain said aid permanently within said recess with the shaving aid between said tapered edges protruding above the adjacent surface of said razor cartridge.

4,683,097

PROCESS OF MAKING A DUNNAGE RACK

George E. Hand, Excelsior, and Roman A. Kramer, Bloomington, both of Minn., assignors to Interplastic Corporation, Minneapolis, Minn.

Filed Sep. 18, 1985, Ser. No. 776,856

Int. Cl.[4] B29C *39/10*

U.S. Cl. 264—268 **4 Claims**

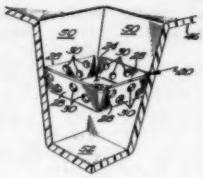
1. A method of forming a dunnage rack with integrally secured caster supports, comprising the steps of:

providing a mold for forming a pallet having a plurality of legs;

positioning a caster support assembly within at least one lower end leg portion of the pallet mold, the caster support assembly including a base plate arranged with means for receiving a caster and at least one flange integrally connected to and projecting upward from an edge of the base plate and having an irregular surface with the base

plate being positioned within said pallet mold leg portion at a location corresponding to the height of a caster to be received by said base plate; and

introducing molding material into the mold such that the molding material engages the caster support flange irregular surface and also blocking said means for receiving a caster, whereby the length of a leg from said mold without caster support assembly and caster is generally equal to the length of a leg from said mold with caster support assembly and caster.



4,683,098

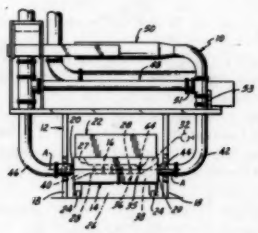
APPARATUS FOR REDUCING WASTE IN A PLASTIC MOLD

Ernest L. Belleville, Barrington, N.H., and Laurent R. Gaudreau, S. Berwick, Me., assignors to Ex-Cell-O Corporation, Walled Lake, Mich.

Filed May 5, 1986, Ser. No. 859,531

Int. Cl.[4] B29C *39/00*

U.S. Cl. 264—302 **8 Claims**



1. A method for molding an article of heat gellable material in a mold comprising the steps of: separating the mold into two parts separated by a gap; filling the gap with heat transfer resistant material; directing heated air across the backside of part of the mold to maintain the temperature of the mold surface at a first predetermined temperature to gel material deposited thereon; and exposing the thermally insulated part of the mold to air at ambient temperature or lower; gelling a predetermined thickness of the gellable material over the heated mold part, removing non-gelled material from the mold, and raising the heated mold to a temperature sufficient to raise the temperature of the mold surface to a cure temperature for curing the material gelled thereover.

4,683,099

MOULDING OF COMPOSITE MATERIALS

Frank A. Buxton, and David J. Barraclough, both of Derby, England, assignors to Rolls-Royce plc, London, England

Filed Feb. 20, 1986, Ser. No. 831,490

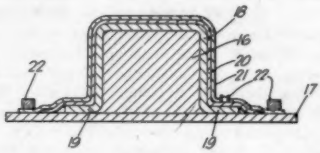
Claims priority, application United Kingdom, Apr. 2, 1985, 8508580

Int. Cl.[4] B29C *43/02, 33/38*

U.S. Cl. 264—511 **13 Claims**

1. A method of moulding composite materials which composite materials comprise reinforcing filaments enclosed in a resin matrix, said method comprising:

interposing a plurality of prepregs comprising resin impregnated filaments between a shaped body and means corresponding in shape to said shaped body, wherein at least a major portion of said shaped body is polytetrafluoroethylene, and



increasing the temperature of the resulting assembly to a temperature within the range of 290° C. and 330° C. so that the resultant thermal expansion of said shaped polytetrafluoroethylene body provides the compression of said prepregs between said shaped polytetrafluoroethylene body and said means corresponding in shape with said shaped body so that said prepregs are consolidated and moulded to a shape corresponding generally with that defined by said shaped polytetrafluoroethylene body.

4,683,100

COPOLYMERIZABLE ETHYLENICALLY UNSATURATED SURFACTANTS FOR LATEX PREPARATION

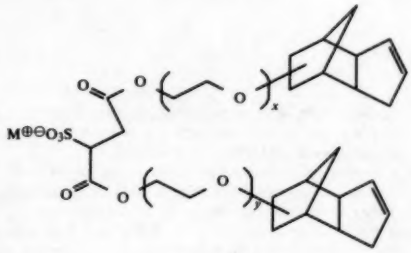
Ronald S. Beckley, Gilbertsville; Rodney L. Randow, Norristown, and Graham Swift, Blue Bell, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 20, 1984, Ser. No. 683,973

Int. Cl.[4] C07C *143/22*; C08F *2/24*

U.S. Cl. 260—513 R **4 Claims**

1. A Compound of the formula



wherein M is a cation selected from the group consisting of alkali metal, ammonium, amino, and hydrogen; and wherein x and y are independently selected from 0 to 2.

4,683,101

CROSS FLOW EVAPORATIVE COIL FLUID COOLING APPARATUS AND METHOD OF COOLING

Robert E. Cates, Arnold, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Dec. 26, 1985, Ser. No. 813,489

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—146 **11 Claims**

1. A cross flow cooling tower comprising

an enclosure having an air inlet at an outer side thereof and an air outlet at an inner side thereof,

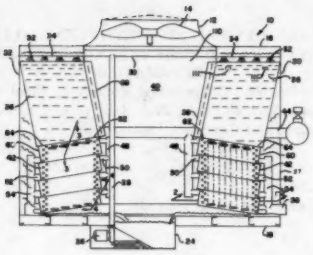
a bundle of fill sheets supported from the enclosure sidewalls adjacent an air inlet,

spray distribution means to supply evaporative liquid downwardly through said bundle of fill sheets,

means causing a draft of air in through the air inlet and across said fill sheets and out through said air outlet cross current to said evaporative liquid,

and a plurality of fluid conduit means supported below said bundle of fill sheets in the path of said evaporative liquid, each of the fluid conduit means connected to an input manifold adjacent said air outlet to receive a fluid to be cooled and to an exit manifold adjacent said air inlet to permit the cooled fluid to exit the fluid conduit assemblies whrein the liquid draining downwardly from the fill sheets is cooled by the air flow into the air inlet, and the fluid conduit means receive the fluid to be cooled at their upper section adjacent said air outlet such that the warmest water draining from the fill first contacts the fluid conduit means which contain the warmest incoming internal fluid, and

wherein said exit manifold receives cooled fluid adjacent the air inlet such that the coolest fluid falling from the fill sheet bundle contacts the portion of the fluid conduit



means containing the coolest fluid and that the coolest air entering the air inlet contacts the portion of the fluid conduit means containing the coolest fluid.

5. A method of cooling a liquid comprising the steps of

providing a frame assembly with a cross draft mechanism having an air inlet side and an air outlet side,

spraying liquid from nozzles at the top of said frame assembly downward to a collection sump and pumping said liquid from the sump upwardly to said nozzles,

providing a sheet fill assembly under the liquid spray,

and providing a coil assembly forming a heat exchanger below said sheet fill assembly, connecting an input of said coil assembly to a source of fluid to be cooled and an output of said coil assembly to an outlet to receive cooled fluid exiting the cooling tower, wherein the input of said coil assembly is located in close proximity to said air outlet side of said frame assembly and said outlet of said coil assembly is located in close proximity to said air inlet side of said frame assembly to assure that the warmest air at the outlet side of said frame assembly initially contacts the warmest fluid near the input of said coil assembly and that the coolest air at the input side of said frame assembly initially contacts the coolest fluid near the output of said coil assembly.

4,683,102

DEVICE FOR OPERATING A CLUSTER OF NEUTRON ABSORBER ELEMENTS IN A PRESSURIZED WATER NUCLEAR REACTOR

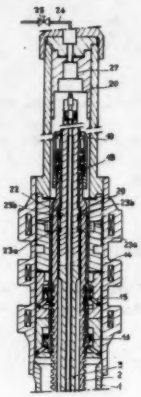
Jean Martin, Chatillon, and René Peletan, La Varenne Saint-Hilaire, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed Jun. 18, 1984, Ser. No. 621,658

Claims priority, application France, Jun. 17, 1983, 83 10028

Int. Cl.[4] G21C 7/00

U.S. Cl. 376—209 **12 Claims**



1. In a spectral shift pressurized water reactor comprising:

(a) a vessel,

(b) a core comprising a plurality of nuclear fuel assemblies, each containing a plurality of first vertical guide tubes and a plurality of second vertical guide tubes,

(c) a plurality of sets of control rods for controlling the power of the reactor having control rods movable within and along respective ones of the first guide tubes between a predetermined lower position and a predetermined upper position,

(d) a plurality of clusters of spectral shift elements for changing the neutron energy spectrum of the reactor, each of said cluster being associated to a set of control rods, having elements movable within and along respective ones of the second guide tubes of the corresponding assembly of said set of control rods and being arranged to be maintained in one of two fixed positions including a low position of maximum insertion of the elements in the core and a high position of complete withdrawal of the elements from said core,

operating means for operating said set of control rods and said clusters of spectral shift elements comprising:

first operating means for operating sets of control rods up and down comprising a plurality of first vertical control shafts movable vertically between a second predetermined lower position and a second predetermined upper position and arranged to go further when forced to a higher overtopped position situated above said second predetermined upper position, each of said first vertical control shafts having a cylindrical tubular shape having a bottom end connected respectively to a corresponding set of control rods and having over the greatest portion of its length a part of a first internal diameter and over a small portion of its length a part of a second internal diameter, said second internal diameter being substantially smaller than said first internal diameter and being situated near the bottom end of said first shaft,

second operating means for operating clusters of spectral shift elements comprising a plurality of second vertical

control shafts each respectively mounted coaxially inside the corresponding first shaft of the associated set of control rods, respectively connected to each cluster and movable in the internal cylindrical space of corresponding first shaft, each of said second shafts having a widened cylindrical part along a small portion of its length, said small portion constituting a piston situated near the upper part of the said second shaft and coming into position around the internal part of substantially smaller diameter of the corresponding first shaft when said first shaft has raised to is higher overtopped position,

said piston comprising at its periphery at least one solid joint, radially expandable to a certain extent under a predetermined pressure and which diameter in rest condition is substantially smaller than the first internal diameter of the first control shaft and substantially similar to the second internal diameter of said first control shaft and when sollicited by pressure is similar to said first internal diameter,

said operating means further comprising pressure reduction means arranged to be connected to the internal cylindrical space of each of the first control shafts when said first shaft has raised to its higher overtopped position,

and capable of moving in the high position of complete withdrawal of the elements of the cluster the corresponding second control shaft connected to said cluster of spectral shift elements under the effect of a predetermined pressure reduction created in the internal space of the first control shaft above the piston.

4,683,103

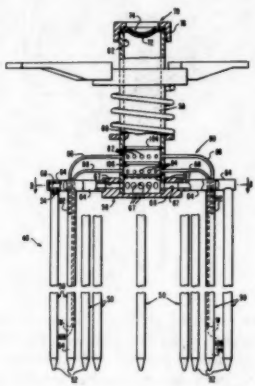
SPECTRAL SHIFT APPARATUS AND METHOD FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Randy G. Lott, Swissvale, and Frank J. Baloh, Dawson, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 12, 1985, Ser. No. 701,051

Int. Cl.[4] G21C *7/26*

U.S. Cl. 376—209 **20 Claims**



1. For use in a fuel assembly for a nuclear reactor including an organized array of nuclear fuel rods and moderator/coolant liquid flowing along said fuel rods, a spectral shift apparatus for controlling nuclear reactivity in said assembly, said apparatus comprising:

(a) at least one elongated hollow tubular body having opposite ends and containing a quantity of water equivalent to a predetermined small fraction of the volume of said tubular body, said body being adapted to displace a predetermined volume of said moderator/coolant liquid;

(b) first means attached to and sealing one of said opposite ends of said tubular body; and

(c) second means communicating with and sealing the other of said opposite ends of said tubular body, said second means including

(i) a member in the form of a replaceable disk being rupturable at a given pressure differential across said member,

(ii) a baffle screen being disposed adjacent to said rupture disk so as to restrict said disk to rupturing in one predetermined direction, and

(iii) an annular cap removably attached to said other opposite end of said tubular body for coupling said disk and screen thereto so as to seal said other end thereof.

4,683,104

EQUIPMENT FOR THE INSPECTION OF FUEL RODS OF NUCLEAR REACTORS

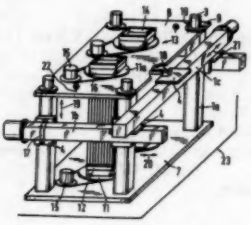
Rainer Scharpenberg, Waldmichelbach, Fed. Rep. of Germany, assignor to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,687

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419765

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—251 **3 Claims**



1. Device for the inspection of fuel rods combined into fuel rod bundles in a fuel element of a nuclear reactor, comprising a frame for supporting a fuel element including a base plate, a cover plate and four supports in the form of four first leadscrew drive mechanisms, two mutually parallel second leadscrew drive mechanisms attached to and extending transversely to said first leadscrew drive mechanism, a third leadscrew drive mechanism jointly supported by and extending transversely to said second leadscrew drive mechanism, and an accessory carrier mechanism disposed on said third leadscrew drive mechanism and movable in a plurality of levels for entering gaps between fuel rods of the fuel element.

4,683,105

TESTABLE, FAULT-TOLERANT POWER INTERFACE CIRCUIT FOR NORMALLY DE-ENERGIZED LOADS

Robert E. Hager, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1985, Ser. No. 793,381

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—259 **12 Claims**

10. A power interface circuit for supplying power from a power line to a normally de-energized process control apparatus in a pressurized light water nuclear power system in dependence upon three input signals, comprising:

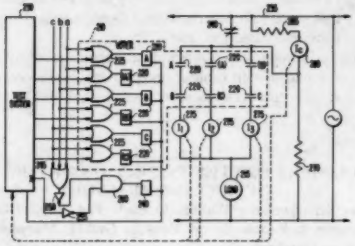
voter means for supplying power to the normally de-energized load when at least two of the three input signals indicates that the normally de-energized load should be activated;

a normally closed switch, operatively connected to the power line and said voter means, for supplying power to said voter means during ordinary operation;

a first resistor operatively connected to the power line;

a current detector operatively connected to said first resistor and said voter means;

a second resistor operatively connected to said current detector and ground; and



current sensor means, operatively connected between said voter means and the normally de-energized load, for detecting the power supplied to the normally de-energized load by said voter means.

4,683,106

WIRING INSTALLATION ABOVE THE COVER OF A NUCLEAR REACTOR VESSEL FOR CONNECTION OF ELECTRIC DEVICES

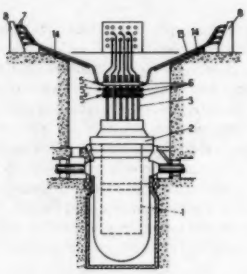
Serge Jahnke, Paris, France, assignor to Framatome & Cie., Courbevoie, France

Filed Jul. 8, 1985, Ser. No. 752,426

Claims priority, application France, Jul. 6, 1984, 84 10758

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—259 **5 Claims**



1. A wiring installation located in a nuclear reactor building containing a nuclear reactor vessel having a vertical axis provided with a cover for connection of electric devices of the nuclear reactor, comprising:

(a) a plurality of layers of fluid tight conduits located substantially above said cover and disposed perpendicularly to the said axis of the reactor vessel, the conduits in each layer being substantially parallel to each other and the conduits in one layer being disposed at an angle to the conduits in another one of said layers,

(b) a plurality of first cables each extending from one of said devices and terminated with a first fixed connector located above said cover, those of the first fixed connectors which correspond to similar devices having similar positions,

(c) a plurality of second cables each associated with one of the first cables and each having

(i) a first section having two connectors at the ends thereof, one for disconnectable connection to one of said first fixed connectors and the other for disconnectable connection to a fixed lead-in connector leading into one of said fluid tight conduits located substantially horizontally above said cover,

(ii) a second section inside said conduit connected at one of the ends thereof to the lead-in connector and at the other end to a fixed lead-out connector leading out from said conduit,

(iii) a third section having two disconnectable connectors at the ends thereof for respective connection to said fixed lead-out connector and to a second fixed connector carried by a plate remote from the reactor vessel in said building,

(d) means for supporting said second cables between the first fixed connectors and the second fixed connectors, and

(e) wherein each one of said first fixed connectors is associated with one of said lead-in connectors which opens into an adjacent one of said conduits, so that all the first sections each connecting one of the lead-in connectors to one of the first fixed connectors, and corresponding to similar devices, are of the same length, while the first sections corresponding to different devices are of different lengths.

4,683,107

METHOD AND DEVICE FOR REPLACING NEUTRON ABSORBER RODS

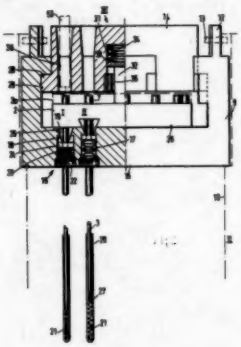
Günter Bäro, Weinheim; Werner Kraus, and Wilfried Stindt, both of Mannheim, all of Fed. Rep. of Germany, assignors to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 660,895

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337636

Int. Cl.[4] G21C *19/02*

U.S. Cl. 376—260 **8 Claims**



1. Method for replacing neutron absorber rods in a storage pit, the absorber rods being mounted with their upper ends in bores formed in a mounting device and the absorber rods being movable within guide tubes of a nuclear reactor fuel assembly, including a holding device firmly attached to a fixed location of the storage pit, the holding device having holder tubes for absorber rods, which comprises:

(a) placing and locking the mounting device with the neutron absorber rods in the holding device;

(b) disconnecting the mounting device from at least one neutron absorber rod to be replaced;

(c) removing the mounting device with any neutron absorber rods still attached to it from the holding device;

(d) removing the disconnected neutron absorber rods remaining in holder tubes of the holding device for storage;

(e) placing new neutron absorber rods in the empty holder tubes; and

(f) placing the mounting device with any neutron absorber

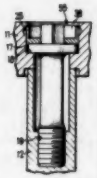
rods still connected to it in the holding device, and connecting the mounting device to the new neutron absorber rods.

4,683,108

LOCKING SCREW APPARATUS AND METHOD FOR UNDERWATER REMOTE REPLACEMENT

Leonard J. Balog, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1985, Ser. No. 807,143
Int. Cl.[4] G21C *19/00*; F16B *39/10*
U.S. Cl. 376—260 **20 Claims**



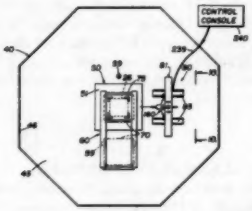
17. A method for locking in place a screw which secures together first and second structures in the internal region of a nuclear reactor core, wherein the first structure has a screw bore therethrough with a counterbore portion formed in an outer surface thereof, said method comprising the steps of: forming a lateral recess in the counterbore portion and spaced from said outer surface, providing an elongated screw having an enlarged shoulder flange and an angular drive head with a lateral width substantially less than that of the counterbore portion, disposing the screw through the screw bore in threaded engagement with the second structure and with the shoulder rotatably seated in the counterbore portion, providing a locking member having an angular opening therein and disposing it in the counterbore portion against the flange with the drive head received in the opening for engagment with the locking member to prevent rotation with respect thereto, and deforming a portion of the locking member into the recess for engagement therewith to prevent movement of the locking member with respect to the first structure.

4,683,109

DEBRIS REMOVAL SYSTEM FOR A NUCLEAR FUEL ASSEMBLY

Frank W. Cooper, Jr., Monroeville, and George F. Dailey, Plum Boro., both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1985, Ser. No. 703,008
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—261 **26 Claims**



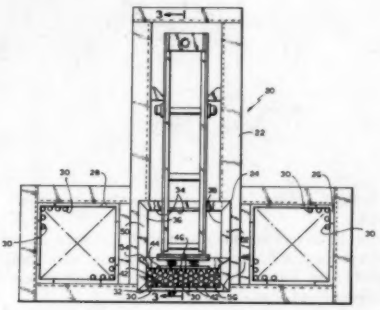
24. A system for working on an elongated nuclear fuel assembly suspended vertically and submerged in a spent fuel pool having a plurality of fuel assembly racks at the bottom thereof, said system comprising: a work platform disposable in the pool and adapted to be supported on the fuel assembly racks, said platform having an opening therein disposed in registry with a selected one of the underlying racks; guide means carried by said platform for guiding the suspended fuel assembly into said opening and the selected rack to accommodate vertical movement of the fuel assembly into and out of the rack to make different portions of the fuel assembly accessible from said platform; and tool manipulating apparatus disposable on said platform adjacent to said opening, said tool manipulating apparatus including a tool carriage, a plurality of tool holders for respectively holding a plurality of associated tools, each of said tool holders being mounted on said tool carriage for reciprocating movement with respect thereto along a predetermined axis between extended and retracted conditions, said tool carriage including selection means accommodating disposition of a selected one of said tool holders in a work configuration with respect to the associated fuel assembly, motive means for effecting movement of said tool carriage along any of three orthogonal axes including said predetermined axis for performing work with respect to the fuel assembly, yieldable means resiliently urging each of said tool holders to its extended condition with a predetermined force less than the minimum force which could damage the associated fuel assembly, whereby engagement of the fuel assembly by a tool with a force in excess of said predetermined force in response to movement of said tool carriage toward the fuel assembly along said predetermined axis causes said tool holder to move from its extended condition toward its retracted condition with respect to said tool carriage, and control means for remotely controlling operation of said motive means, said control means including means responsive to said movement of said tool holder a predetermined distance along said axis from its extended condition toward its retracted condition for generating a signal.

4,683,110

APPARATUS AND METHOD FOR CONSOLIDATING SPENT FUEL RODS

Thomas O. Baudro, Gales Ferry, and John S. Leonard, Lyme, both of Conn., assignors to Proto-Power Corporation, Groton, Conn.

Filed Jun. 14, 1985, Ser. No. 745,409
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—261 **38 Claims**



1. An apparatus for consolidating spent fuel rods from spent fuel assemblies, comprising:

a container having a front wall, a back wall, side walls connected between the front and back walls, a bottom, and a plurality of stationary flutes along the front wall, the plurality of stationary flutes defining a plurality of channels along the front wall, each channel being sized to accept a fuel rod, the flutes and the channels being stationary;

a plurality of springs, the springs being aligned with and bearing against the flutes and the channels when no fuel rods have been inserted into the container and the springs

are located proximate the front wall, each spring being capable of maintaining a fuel rod in a preselected location in the container;

support means located within the container for supporting the springs, the support means being movable within the container in a substantially horizontal direction between the front and back walls of the container; and

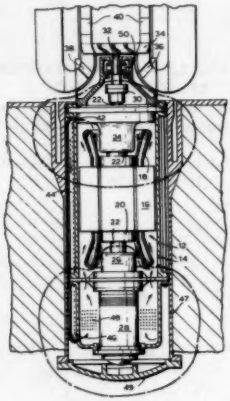
positioning means for positioning the support means between the front and back walls of the container, the positioning means permitting the support means to take non-discrete positions between the front and back walls.

4,683,111

GAS CIRCULATOR FOR A NUCLEAR REACTOR AND A METHOD FOR USE THEREOF

John L. Helm, Groton, and John S. Leonard, Lyme, both of Conn., assignors to Proto-Power Corporation, Groton, Conn.

Filed Jan. 23, 1986, Ser. No. 821,844
Int. Cl.[4] G21C *3/56*
U.S. Cl. 376—391 **51 Claims**



1. A gas circulator for a nuclear reactor, comprising:

a stator;

a rotor having a rotor shaft with a first end and a second end;

an impeller attached to the first end of the rotor shaft;

a first radial active magnetic bearing positioned proximate the first end of the rotor shaft;

a first radial backup bearing positioned proximate the first end of the rotor shaft;

a second radial active magnetic bearing positioned proximate the second end of the rotor shaft;

a second radial backup bearing positioned proximate the second end of the rotor shaft;

an axial active magnetic bearing positioned between the first and second ends of the rotor shaft; and

an axial backup bearing positioned between the first and second ends of the rotor shaft;

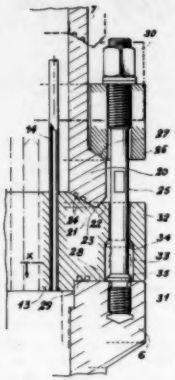
wherein two of the backup bearings are located within a sealed chamber.

4,683,112

STEAM GENERATOR, PARTICULARLY FOR PRESSURIZED WATER NUCLEAR REACTOR

Jean-Paul Badoux, Le Puy Sainte; Jean E. Chaix, Pierrevert, and Michel Metteey, Eguilles, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Mar. 15, 1985, Ser. No. 712,176
Claims priority, application France, Mar. 23, 1984, 84 04563
Int. Cl.[4] F22B *37/64*
U.S. Cl. 376—402 **1 Claim**



1. A pressurized water nuclear reactor steam generator, said nuclear reactor having a reactor core, comprising a water box, in which circulates the hot water leaving the reactor core in order to then penetrate a series of heat exchange tubes, installed in a tube plate and extending within a secondary ferrule traversed by secondary water, the water box, the secondary ferrule and the tube plate being three independent dismantable assemblies, wherein the secondary ferrule is terminated in its lower part by an annular neck having on the one hand a double concical bearing surface cooperating by two O-rings with a female groove having two conical bearing surfaces hollowed from the upper surface of the tube plate and on the other hand, on its outer periphery, a concical bearing surface associated with a locking ring; the upper part of the water box is terminated by a flange provided with a planar connecting bearing surface with two interposed O-rings; on the inner surface of the tube plate; and a system of tie bolts, certain of which pass through handling brackets on the periphery of the tube plates, whilst studs installed in the flange of the water box and nuts ensure, by means of the locking ring, the assembly and tight locking of the three aforementioned independent assemblies, further, wherein the handling brackets installed on the periphery of the tube plate have recesses with concial bearing surfaces, where the conical bearing surfaces make it possible to receive conical collars equipping the studs to that, during a dismantling manipulation of the water box alone, it is possible to handle the tube plate-secondary ferrule assembly without breaking the seal thereof.

4,683,113

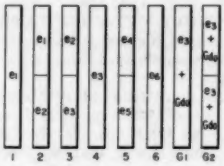
NUCLEAR FUEL ASSEMBLY

Takaaki Mochida; Junichi Yamashita; Toshiro Yoshioka, and Michihiro Ozawa, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,604
Claims priority, application Japan, May 16, 1984, 59-98429
Int. Cl.[4] G21C *3/00*
U.S. Cl. 376—419 **20 Claims**

1. A nuclear fuel assembly having a plurality of fuel rods each containing a multiplicity of fuel pellets, comprising: first

fuel rods each containing a burnable poison over substantially the entire axial length thereof, said first fuel rod having upper and lower axial regions and a greater mean enrichment in the



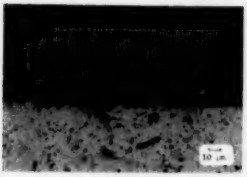
upper axial region thereof than that in the lower axial region thereof; and second fuel rods containing no burnable poison and having a uniform enrichment distribution over substantially the entire axial length thereof.

4,683,114

BURNABLE ABSORBER-CONTAINING NUCLEAR FUEL PELLETS AND FORMATION OF THE SAME

Shih-Ming Ho, Penn Hills Township, Allegheny County, and Kenneth C. Radford, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1984, Ser. No. 678,604
Int. Cl.[4] G21C *3/00*
U.S. Cl. 376—419 **26 Claims**



1. The method of forming nuclar fuel pellets having a burnable absorber combined therewith comprising:

combining discrete particles of a boron-containing burnable absorber and discrete particles of a boroncontaining glass composition to form a coating mixture, said boron-containing glass composition comprising 20–30 percent by weight B_2O_3;

applying said coating mixture to the surface of nuclear fuel pellets;

heating said nuclear fuel pellets having said coating mixture on the surface thereof, to an elevated temperature sufficient to melt said boron-containing glass, and incorporate said boron-containing burnable absorber in the resultant melt while preventing reaction between the burnable absorber and the boron-containing glass; and

cooling said pellets.

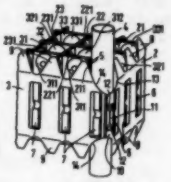
4,683,115

NUCLEAR REACTOR FUEL ASSEMBLY

Gustav Frömel, Erlangen, and Alexander Steinke, Ebermannstadt, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,888
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330850
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—439 **6 Claims**

1. Nuclear reactor fuel assembly having a grid-shaped spacer with square grid meshes, wherein mutually parallel rods are arranged, respectively, in a grid mesh, the spacer having flat outer straps extending transversely to the rods and an intermediate strip extending parallel to the rods between two of the respective outer straps, the intermediate strip being inclined relative to the two outer straps, comprising a rejection rise formed at the outside of the intermediate strip and extending



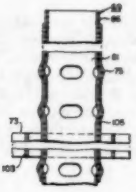
outwardly and away from the grid meshes in direction of a diagonal of a grid mesh located at a corner betwen the two outer straps, said rejection rise being disposed transversely to the two outer straps and being inclined downwardly towards two respective ends of the intermediate strip in longitudinal direction of the rods.

4,683,116

NUCLEAR REACTOR

Harry M. Ferrari, Edgewood Boro, and John F. Wilson, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1985, Ser. No. 732,220
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—447 **4 Claims**



1. A non-controlled nuclear fuel assembly which is not penetrated by control rods during operation of a nuclear reactor in whose core said non-controlled nuclear fuel assembly is contained; the said nuclear fuel assembly including a top nozzle, a bottom nozzle, a plurality of nuclear fuel rods extending between said nozzles, a plurality of grids extending along said fuel rods for maintaining said fuel rods positioned between said nozzles, and structural members, each of which is a hollow tube, secured to said top and bottom nozzles for forming said assembly into an integral unit, the said assembly being characterized by structural members of substantial thickness and at least certain of which contain burnable neutron absorbers.

4,683,117

NUCLEAR FUEL ASSEMBLY INCORPORATING PRIMARY AND SECONDARY STRUCTURAL SUPPORT MEMBERS

William R. Carlson, Pittsburgh; Robert K. Gjertsen, Monroeville, and John V. Miller, Munhall, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1985, Ser. No. 774,126
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—449 **12 Claims**

1. A nuclear fuel assembly, comprising:

(a) an upper end structure;

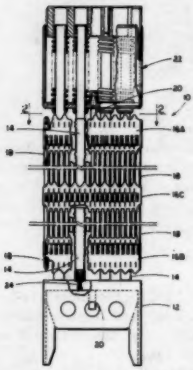
(b) a lower end structure;

(c) a plurality of elongated primary structural members

extending longitudinally between and rigidly interconnecting said upper and lower end structures, said upper and lower end structures and primary structural members together forming a rigid structural skeleton of said fuel assembly;

(d) a plurality of transverse grids being supported on said primary structural members at axially spaced locations therealong between said upper and lower end structures;

(e) a plurality of fuel rods extending through and being supported by said grids between said upper and lower end



structures so as to extend in generally side-by-side spaced relation to one another and to said primary structural members; and

(f) a plurality of elongated secondary structural members extending longitudinally between but unconnected with said upper and lower end structures, said secondary structural members extending through and rigidly interconnected with said grids so as to extend in generally side-by-side spaced relation to one another, to said fuel rods and to said primary structural members so as to bolster the stiffness of said structural skeleton of said fuel assembly.

4,683,118

PROCESS AND APPARATUS FOR MANUFACTURING A PRESSED POWDER BODY

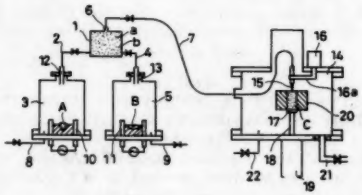
Chikara Hayashi, Chigasaki, and Seiichiro Kashu, Yachimata, both of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,683

Claims priority, application Japan, Oct. 9, 1984, 59-210366

Int. Cl.⁴ B22F *7/00*

U.S. Cl. 419—23 **6 Claims**



1. A process for producing a pressed powder body comprising mixing together ultrafine particles having a diameter of 0.001 μ-1 μ of at least two different materials in a carrier gas and spraying the mixture of ultrafine particles in the carrier gas onto an objective surface such that there is formed by the pressure of the spraying a pressed body comprising an aggregated solid the mass of the ultrafine particles wherein the ultrafine particles of the different materials are mixed together uniformly throughout the whole aggregated solid mass.

4,683,119

PLATINUM GROUP METAL-CONTAINING ALLOY

Gordon L. Selman, and Richard J. Midgley, both of London, England, assignors to Johnson Matthey & Company, Limited, London, England

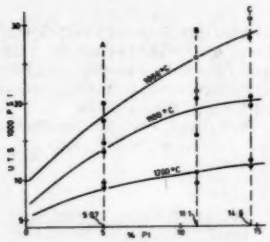
Division of Ser. No. 40,184, May 18, 1979, abandoned, which is a division of Ser. No. 827,748, Aug. 25, 1977, abandoned, which is a division of Ser. No. 593,250, Jul. 7, 1975, Pat. No. 4,061,495. This application Mar. 2, 1981, Ser. No. 239,583

Claims priority, application United Kingdom, Jul. 8, 1974, 7430168

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.⁴ C22C *19/05*

U.S. Cl. 420—444 **5 Claims**



1. An alloy consisting of:

(a) 54–78% nickel;

(b) 13–25% chromium;

(c) 5–15% platinum; and

(d) an added effective amount up to 7 weight percent of aluminum and/or an added effective amount up to 6 weight percent of titanium.

4,683,120

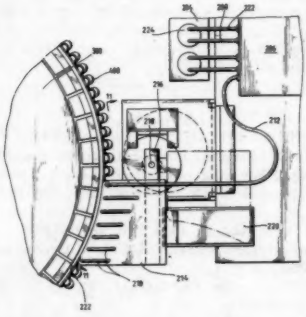
BIOLOGICAL FLUID ASSAY SYSTEM

Peter M. Meserol, and Jesse L. Acker, both of Whippany, N.J., assignors to Gamma Biologicals, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 546,345, Oct. 28, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 660,721

Int. Cl.⁴ G01N *21/07, 35/06*

U.S. Cl. 422—72 **15 Claims**



1. An apparatus for determining the reactive characteristics of a biological mixture of a specimen and a reagent comprising:

(a) a centrifuge rotor;

(b) an energy transmissive, flexible belt formable into a cylinder and removably mounted for movement in unison with said centrifuge rotor, said belt including a plurality of specimen containers, said specimen containers each including a flat element having an inner surface, an outer surface, an upper surface and a lower end, and an indented element having an inner surface, an outer surface, an upper end and a lower end, and having at least one smooth, outwardly, radially extending and vertically oriented indentation formed therein, the indentation vertically gradually increasing in an outwardly extending radial depth along a moderatley inclined slanting segment to a smoothly curved radial apex then abruptly decreasing in radial depth along a severely inclined segment and thereafter extending upwardly along a uniformly shallow generally vertical segment to the upper end of said indented element, said flat element and said indented element being connected together with the inner surface of the flat element in contact with the inner surface of said indented element, said open upper end of said indented element forming an opening for filling said specimen containers; and

(c) a detection system for irradiating the plurality of specimens contained within said belt and for optically measuring the reactive characteristics of the specimens.

4,683,121

REACTOR FOR NON-ISOTHERMIC REACTIONS FOR THE PREPARATION OF HYDROCARBONS

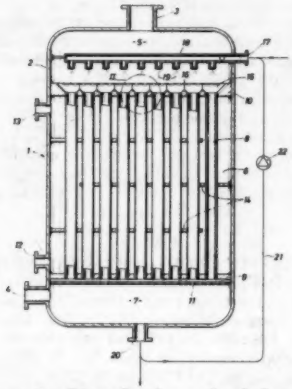
Johan C. Goudriaan, and Maarten J. Van der Burgt, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 22, 1985, Ser. No. 736,908

Claims priority, application United Kingdom, May 29, 1984, 8413596

Int. Cl.[4] B01J *8/06*

U.S. Cl. 422—197 **9 Claims**



1. An apparatus for performing a chemical reaction in a reaction vessel, which reaction vessel comprises a normally vertically extending outer vessel wall, means defining a fluid collection zone situated in the bottom of said vessel, an upper tube plate situated in the upper portion of said vessel with means defining a plurality of hexagonal openings having a honeycomb configuration within said upper tube plate, a lower tube plate permeable by fluids but impermeable to solid material situated in the lower portion of said vessel, means for circulating a heat transfer medium situated intermediate said upper and lower tube plates, a fluid introduction zone having fluid inlet means comprising a plurality of inlet fluid spray nozzles situated in axial alignment with said plurality of openings in said upper plate and designed to emit a spray pattern for spray of said inlet fluid in a hexagonal honeycomb configuration substantially congruent to the honeycomb configuration of hexagonal openings to provide for passage directly downward in said hexagonal openings in said upper tube plate and thereby uniform distribution of said inlet fluid over said upper tube plate and to thereby inhibit sideward flow of said inlet fluid over said tube plate and a fluid inlet means situated in said vessel at a point elevated with respect to said upper tube plate, a fluid outlet means situated in the bottom of said vessel, and a plurality each having a top portion of staggered parallel tubes and extending from and in intercommunication with a respective one of said hexagonal openings in said upper tube plate and extending to a point in contact with said lower tube plate, wherein said staggered tubes are in intercommunication with said upper plate through said plurality of hexagonal openings in said upper plate, each of said hexagonal openings having an upper part and a lower part, wherein said lower part is closely fitted to the top portion of a respective parallel tube and wherein said upper part is substantially concentric with said lower part and diverging in an upward direction to an upper end, said upper end being situated contiguous to and adjacent with respect to the edges of other upper ends of said openings to define said honeycomb configuration in said upper tube plate.

4,683,122

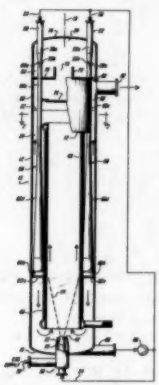
GAS-LIQUID REACTOR AND METHOD FOR GAS-LIQUID MIXING

Joseph J. Concordia, Boston, Mass., and Donald R. Hall, Barrington, R.I., assignors to Herzog-Hart Corporation, Boston, Mass.

Filed Apr. 14, 1986, Ser. No. 851,725

Int. Cl.[4] B01F *3/04*

U.S. Cl. 422—227 **27 Claims**



1. A gas-liquid reactor comprising:

a vessel for containing a liquid, said vessel having a sidewall, a top and a bottom, a head space being defined between the liquid surface and the top of said vessel;

a submerged jet nozzle positioned at the bottom of said vessel for injecting liquid and gas upwardly into the liquid in said vessel;

at least two free jet nozzles positioned at the top of said vessel in said head space for injecting a liquid jet downwardly into the liquid in said vessel such that gas in said head space is entrained into said liquid jet and mixed into the liquid in said vessel;

means for supplying reactive gas to said submerged jet nozzle;

means for supplying liquid to said submerged jet nozzle and said free jet nozzles;

means for venting reacted gas from said vessel; and

baffle means for directing reactive gas rising from said liquid surface to said head space for entrainment in said liquid jet, and for directing reacted gas rising from said liquid surface to said venting means.

4,683,123

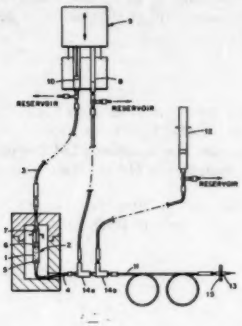
OSMIUM-191/IRIDIUM-191M RADIONUCLIDE

Furn F. Knapp, Jr.; Thomas A. Butler, both of Oak Ridge, Tenn., and Claude Brihaye, Liege, Belgium, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 26, 1985, Ser. No. 769,519

Int. Cl.[4] B01D *59/26*

U.S. Cl. 423—2 **25 Claims**



1. An osmium-191/iridium-191m generator system comprising an adsorbent consisting essentially of activated carbon, said adsorbent being loaded with a compound containing Os-191.

4,683,124

ACTINIDE RECOVERY PROCESS

Anthony C. Muscatello; James D. Navratil, and Mark T. Saba, all of Arvada, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 13, 1985, Ser. No. 744,441

Int. Cl.[4] C01G *56/00*

U.S. Cl. 423—6 **5 Claims**

1. A process for removing polymeric plutonium from aqueous solutions, comprising:

(a) loading a solid solvent extractant on a solid inert support by melting the extractant and mixing it with the support;

(b) contacting a feed solution containing plutonium polymer with said loaded support to remove the polymer from the solution; and

(c) recovering the polymer from the loaded support; wherein said solid solvent extractant is selected from the group consisting of trioctylphosphine oxide, octylphenyl-N,N-diisobutylcarbamoylmethylphosphine oxide, triphenylphosphine oxide, thenoyltrifluoruacetone, crown ethers, and mixtures thereof.

4,683,125

METHOD FOR PURIFYING AN INDUSTRIAL RAW MATERIAL GAS AND A PURIFIER FOR USE IN SAID METHOD AND A METHOD OF MANUFACTURING SAID PURIFIER

Atsushi Yusa, Nagano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

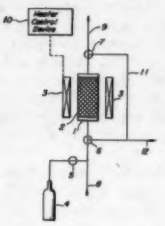
Filed Mar. 27, 1985, Ser. No. 716,446

Claims priority, application Japan, Apr. 2, 1984, 59-66453

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] C01B *13/00*

U.S. Cl. 423—219 **8 Claims**



1. A method of purifying an industrial raw material gas selected from the group consisting of hydrogen, nitrogen, argon, carbon dioxide and ammonia, said raw material gas containing oxygen and water components, comprising the steps of:

(a) preparing a purifier by:

(i) charging a reaction vessel with a carrier selected from the group consisting of a porous K^+ ion-exchange A, X or Y zeolite and porous carbon molecular sieves;

(ii) heating said carrier to a thermal decomposition temperature of at least one gas selected from the group consisting of hydride and fluoride gases of at least one element selected from the group consisting of Si and Ge; and

(iii) introducing said at least one gas of said at least one element into the reaction vessel, thereby depositing a layer on said carrier of at least one substance selected from the group consisting of a hydrogenated amorphous substance and a fluorinated amorphous substance of said at least one element;

(b) heating said purifier;

(c) contacting the industrial raw material gas with the heated purifier to remove simultaneously said oxygen and water components from the industrial raw material gas.

4,683,126

METHOD FOR PRODUCING ALKALINE EARTH METAL BORATE DISPERSIONS

Kiyoshi Inoue, Hiratsuka, and Yoshiharu Nose, Yokosuka, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,619

Claims priority, application Japan, Mar. 8, 1985, 60-46252

Int. Cl.[4] C01B *15/12, 35/12*

U.S. Cl. 423—280 **19 Claims**

1. A method for producing an alkaline earth metal borate dispersion, consisting of two steps of:

(I) reacting at 20°–100° C. a mixture of the following ingredients (A) to (E)

(A) 100 parts by weight of the oil-soluble neutral sulfonate of an alkaline earth metal,

(B) 10–100 parts by weight of the hydroxide or oxide of an alkaline earth metal,

(C) boric acid in an amount which is 0.5–6.5 times in mol that of the ingredient (B),

(D) 5–50 parts by weight of water and

(E) 50–200 parts by weight of a dilution solvent and then

(II) heating the resulting reaction mixture to 100°–200° C. to remove the water.

4,683,127

PROCESS FOR MAKING WET-PROCESS PHOSPHORIC ACID

Friedrich Kolkmann, Brühl; Herbert Ressel, Erftstadt; Reinhard Gradl, Erftstadt, and Günther Schimmel, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,289

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505247

Int. Cl.⁴ C01B *25/16*

U.S. Cl. 423—321 R **5 Claims**

1. Process for preventing precipitation of Na_2SiF_6 during mineral acid treatment of a fluorine-containing phosphate ore which is lower in aluminum content than Kola phosphate ore, the mineral acid treatment resulting in the formation of a suspension containing less than 0.3 weight-% aluminum based on the P_2O_5 content of the suspension, the liquid phase of said suspension containing sodium ions, crude phosphoric acid, and scrubbing water recycled from subsequent purification of the crude phosphoric acid, the solid phase of said suspension containing solid material formed and retained by said mineral acid treatment, said process comprising:

adding, either to the phosphate ore or to said suspension, a quantity of an aluminum compound selected from the group consisting of aluminum hydroxide, aluminum sulfate, clay, or aluminate sufficient to increase the aluminum concentration in said suspension to 0.3–1.0 weight-%, based on the P_2O_5 content thereof.

4,683,128

PROCESS FOR MANUFACTURING HIGH PURITY SILICA

Koichi Orii, Yokohama; Masashi Nishida, Hachinohe; Junsuke Yagi, and Iwao Ohshima, both of Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,773

Claims priority, application Japan, Jun. 27, 1985, 60-139145; Jun. 27, 1985, 60-139146; Feb. 5, 1986, 61-22068; Feb. 5, 1986, 61-22069

Int. Cl.⁴ C01B *33/12*

U.S. Cl. 423—338 **27 Claims**

1. A process for manufacturing high purity silica having an alkali metal content of 0 to 10 ppm, a chlorine content of 0 to 3 ppm and a uranium content of 0 to 3 ppb, said process comprising:

(1) a step of extruding an aqueous solution of an alkali silicate represented by the general formula:

$$M_2O.nSiO_2$$

wherein M is an alkali metal element and n is a number of moles of SiO_2 of 0.5 to 5, into a coagulating bath comprising a coagulant through a spinning nozzle having a bore diameter of 1 mm or less to coagulate the same, and thereby making the same into a fibrous gel, said aqueous solution having a viscosity in the range of 2 to 500 poise, and

(2) a step of treating the fibrous gel obtained with an acid-containing solution, and then washing the same with water to extract and remove impurities.

4,683,129

PROCESS FOR THE PRODUCTION OF ADVANCED NF_4^+ SALTS

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1981, Ser. No. 271,066

Int. Cl.⁴ C01B *21/00*

U.S. Cl. 423—351 **6 Claims**

1. The method of exchanging the anion in an NF_4^+ salt by ion exchange and in accordance with the following reaction:

$$C_n^+X^- + NF_4SbF_6 \xrightarrow{HF} C_nSbF_6^- + NF_4^+X^-$$

wherein C_n^+ is a graphite cation and X^- is an advanced NF_4^+ salt anion.

4,683,130

METHOD OF GENERATING OXYGEN FOR EMERGENCY USE

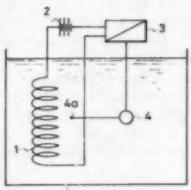
Shinji Ueno, 4-10-9, Tsuboi, Kumamoto-ski, Kumamoto-ken, and Naoki Koga, 207, 5-22-31, Hirao, Chuoh-ku, Fukuoka-shi, Fukoka-ken, both of Japan

Filed Mar. 31, 1986, Ser. No. 846,077

Claims priority, application Japan, Apr. 2, 1985, 60-68375

Int. Cl.⁴ C01B *13/00*

U.S. Cl. 423—579 **19 Claims**



1. A method for generating oxygen for emergency use, comprising:

(a) providing an aqueous solution of an addition compound of sodium carbonate and hydrogen peroxide;

(b) providing an integral catalyst support body having supported on a surface thereof a layer of a catalyst which is capable, when immersed in said solution, of catalysing generation of oxygen gas, at least partly in the form of bubbles which tend to cling to said layer;

(c) repeatedly immersing said surface of said body in said solution, and withdrawing said surface of said body from said solution so as to repeatedly initiate and terminate catalysed generation of oxygen in said solution;

(d) while said surface of said body is immersed in said solution, actively dislodging oxygen bubbles from clinging to said layer.

4,683,131

DIVISIBLE PHARMACEUTICAL TABLET WITH DELAYED ACTIVE INGREDIENT RELEASE

Bernd Zierenberg, and Arun R. Gupte, both of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 751,790, Jul. 3, 1985, Pat. No. 4,595,587, which is a division of Ser. No. 591,988, Mar. 21, 1984, Pat. No. 4,547,359. This application Jan. 31, 1986, Ser. No. 824,782

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3314003

Int. Cl.⁴ A61K *9/26, 9/44, 31/78*

U.S. Cl. 424—467 **4 Claims**

1. The method of making a divisible pharmaceutical delayed active ingredient release tablet with a notched score line,

wherein the rate of release of active agent is independent of the size and nature of the total surface area, and the tablet breaks at the score line, ensuring precise dosage when broken into fragments consisting of a compressed tablet-making composition containing finely divided polyacrylate material prepared by emulsion polymerization, conventional tablet-making excipients and active ingredient molecularly dispersed in said polyacrylate material, which compries dissolving the active ingredient together with the polyacrylate material in an organic solvent, evaporating the solvent from the solution, grinding the residual active ingredient-containing polyacrylate material at a temperature below the glass temperature to form a powder, admixing said powder with conventional tablet-making excipients, and compressing the resulting composition in a tablet making press with a scoring device into a divisible notched, score-lined pharmaceutical tablet.

4,683,132

COMPOSITIONS, DEVICES, AND METHODS FOR EXTENDED CONTROL OF INSECT ACTIVITY

Patricia M. Ronning, St. Paul, and Gregg A. Vandesteeg, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1982, Ser. No. 373,533
Int. Cl.[4] A01N *25/34;* A61K *31/78*
U.S. Cl. 424—409 **20 Claims**

1. A composition for controlling insect activity comprising (a) rough-surfaced cellulosic fibers which comprise a graft copolymer of cellulose and an ethylenically unsaturated material copolymerizable with cellulose, and (b) self-adhered to the surface of said fibers an insect control agent comprising a liquid insecticide encapsulated in a hollow capsule whose shell is permeable to said liquid insecticide.

6. A composition according to claim 1 wherein said copolymerizable material is selected from the group consisting of acrylates, methacrylates, acrylamides, and vinyls.

12. A composition according to claim 1 wherein said liquid insecticide comprises a liquid pyrethroid and said shell comprises a polyurea.

4,683,133

METHOD FOR TREATING PERIODONTAL DISEASE

G. Lee Southard, Fort Collins, Colo., assignor to Vipont Laboratories, Inc., Ft. Collins, Colo.

Filed Aug. 20, 1985, Ser. No. 767,606
Int. Cl.[4] A61K *7/16, 33/30, 31/44*
U.S. Cl. 424—49 **7 Claims**

1. A self-administerable method for the treatment and control of periodontal disease by supragingival irrigation comprising, pumping a dilute aqueous solution of a non-toxic benzo-c-phenanthridine alkaloid salt at concentrations from about 22.5 ug/ml to about 10 mg/ml through an orifice to provide a jet stream at a rate of 250 cc/minute to 600 cc/minute and a pulsation rate of 20 to 200 cycles per second penetrating directly into periodontal pockets associated with periodontal disease, and applying the jet stream of dilute benzo-c-phenanthridine alkaloid salt solution along the margins between the teeth and gums and into the periodontal pockets of an individual with periodontal disease so as to cleanse the diseased tissues and to provide a residue of said benzo-c-phenanthridine alkaloid salt.

4,683,134

WATERPROOF SUNSCREEN COMPOSITIONS

Victor Palinczar, 435 Adeline St., Trenton, N.J. 08611

Filed Dec. 13, 1985, Ser. No. 808,642
Int. Cl.[4] A61K *7/40, 7/42, 7/44*
U.S. Cl. 424—59 **21 Claims**

1. A water-proof sunscreen composition comprising:

A. from about 35% to about 90% by weight of monohydric alcohol;

B. from about 0.1% to about 5.0% by weight of an ethylcellulose polymer having an average ethoxyl substitution from about 2.20 to about 2.65 and an ethoxyl content from about 44.8% to about 52.2%;

C. from about 1.0% to about 30.0% by weight of an active ultraviolet radiation absorber;

D. from about 0.1% to about 5.0% by weight of an acrylic acid crosslinked polymer having a molecular weight from about 4×10 to about 5×10; an average equivalent weight from about 72 to about 80 and a specific gravity from 1.25 to about 1.55; and

E. from about 0.1% to about 5.0% by weight of an alkaline neutralizing agent.

4,683,135

DSCG BINDING PROTEIN AND PROCESS FOR PREPARING SAME

Israel Pecht, Rehovot, and Nachman Mazurek, Raanana, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Continuation of Ser. No. 517,843, Jul. 27, 1983, abandoned. This application Mar. 20, 1986, Ser. No. 843,912
Int. Cl.[4] C07K *15/06, 3/28*
U.S. Cl. 424—85 **15 Claims**

1. An essentially pure protein consisting essentially of the protein, (CBP) , present in nature in membranes of basophile cells and in mast cells, having a molecular weight of about $60,000\pm2,000$ determined by SDS polyacrylamide electrophoresis an isoelectric point of about 3.9 and an amino acid composition of about 4 units of asparagine, 3 units of threonine and serine, 3 units glycine, 2 units alanine, 2 units proline, 1 unit cysteine, 2 units valine, 1 unit methionine, 1 unit isoleucine, 2 units leucine, 1 unit tyrosine, 1 unit phenylalanine, 2 units histamine, 2 units lysine and 1 unit arginine, said protein being able to build calcium and having a calcium dependent affinity to the disodium salt of 1,2 bis(-2 carboxychromon-5-yloxy)-2-hydroxy propane (DSCG).

4,683,136

PROTEINACEOUS ANTIGENS WITH CONFORMATION-INDEPENDENT AND CONFORMATION-DEPENDENT DETERMINANTS

David Milich, Mira Mesa, and Frank Chisari, Del Mar, both of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Mar. 6, 1985, Ser. No. 708,746
Int. Cl.[4] A61K *39/12*
U.S. Cl. 424—89 **8 Claims**

1. A method of enhancing the humoral immune response to an S region immunogen encoded by the hepatitis B virus genome in an animal that exhibits a low response to that immunogen which method comprises introducing into said animal an effective amount of a vaccine comprising a physiologically tolerable diluent that includes dispersed therein a potentiating amount of a pre-S(2) region polypeptide encoded by said viral genome that is chemically coupled to an S region polypeptide immunogen cpable of inducing a protective response in an animal that exhibits a response to an S region-containing immunogen.

4,683,137

TEMPERATURE SENSITIVE REASSORTANT VIRUSES AND A VACCINE AGAINST EQUINE INFLUENZA

Leroy Coggins, Cary, N.C.; Brian R. Murphy, Glen Echo, Md.; Dorothy F. Holmes, Groton, N.Y.; Lynne J. Anguish, and James H. Gillespie, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 369,319, Apr. 16, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,510
Int. Cl.[4] A61K *23/00, 39/12, 39/145;* C12N *7/00*
U.S. Cl. 424—89 **9 Claims**

1. A temperature-sensitive virus capable of providing an equine influenza vaccine which is a reassortant mutant virus,

formed by mating a wild-type equine influenza virus of the A_1 or A_2 subgroups with chemically mutagenized and temperature-sensitive human influenza virus having a shut off temperature in the area of 37° C. to 39° C., said reassortant virus having at least one temperature-sensitive gene and at least two but no more than six human influenza virus derived genes, and being further characterized as having the serotype of the equine influenza virus and the temperature-sensitive defects of the human virus.

4,683,138

LOW MOISTURE, SUGARLESS, CENTER-FILLED CHEWING GUM

Michael Glass, Fairlawn; Joseph Hoholick, Hopatcong, both of N.J., and Daniel A. Orlandi, Flushing, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 8, 1986, Ser. No. 905,373
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—5 **23 Claims**

1. A sugarless center-filled chewing gum piece having an outer sugarless chewing gum shell enclosing a cavity and a sugarless liquid center-fill within said cavity, said chewing gum piece comprising:

A. a chewing gum shell containing not more than about 2% by weight thereof water; and

B. a sugarless liquid center-fill comprising:

1. about 0.2% to about 1.5% by weight of a natural or synthetic gum selected from the group consisting of carboxymethylcellulose, pectin, propylene glycol alginates, agar and gum tragacanth;

2. about 85% to about 93% by weight of a glycerin humectant; and

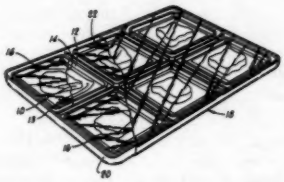
3. about 6% to about 12% by weight of an additional water-miscible humectant ingredient selected from the group consisting of (a) sorbitol solution or (b) sorbitol solution and propylene glycol; wherein said liquid center-fill has a water content of about 6% to about 8%, based on the total weight of the liquid center-fill, and a viscosity of about 20,000 to about 85,000 centipoises at 25° C.

4,683,139

PROCESS FOR PREPACKING FRESH MEAT

Chin S. Cheng, Oklahoma City, Okla., assignor to Wilson Foods Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 753,958, Jul. 11, 1985, abandoned. This application Dec. 9, 1985, Ser. No. 806,609
Int. Cl.[4] A23B *4/00, 4/02, 4/12*
U.S. Cl. 426—265 **15 Claims**



1. A process for the pre-packing of sub-primal fresh pork cuts sized for sale to the consumer in order to enhance and extend the color shelf-life and the microbial shelf-life of the cuts, and to improve the organoleptic qualities of the cuts, without selective pre-screening based upon chemical testing to determine the pH of the cuts or other properties, which process comprises carrying out two steps in sequence as follows:

contacting the fresh pork cuts with an aqueous solution which contains:

(a) a phosphate compound selected from the group of phosphate compounds which includes the alkali metal orthophosphates, the alkali metal pyrophosphates, the alkali metal tripolyphosphates and the alkali metal hexametaphosphates, said phosphate compound being used in an amount of from about 0.1 weight percent to about 2.0 weight percent of the fresh pork cuts so treated and contacted;

(b) a reducing compound selected from the group consisting of ascorbic acid, iso-ascorbic acid, the alkali metal salts of said acids, and reductic acid, said reducing compound being used in an amount which is from about 0.01 weight percent to about 0.1 weight percent of the total weight of the contacted and treated fresh pork cuts; and

(c) a sequestering agent selected from the group consisting of citric acid, tartaric acid, ethylenediaminetetracetric acid, and the sodium and potassium salts of such acids, so as to place in the thus treated pork, from about 0.01 weight percent to about 0.2 weight percent of the sequestering agent; then thereafter

packaging the thus treated pork cuts in a controlled gaseous atmosphere which includes, in gaseous admixture, from about 2 percent to about 25 percent oxygen, and from about 20 percent to about 80 percent carbon dioxide, with the balance being nitrogen, whereby the properties of the thus treated and packaged fresh pork cuts are improved and remain good for a period of at least about 21 days, and so that the pork cuts have a color shelf-life of at least about 21 days, and a microbial shelf-life which is at least as long as the color shelf-life, so that there is no masking of bacterial spoilage resulting from a longer color shelf-life than microbial shelf-life, and so that all of the cuts so treated have substantially uniform shelf-life properties and substantially uniformly good organoleptic properties, regardless of the pH condition of the chops at the outset of the treatment.

4,683,140

PROCESS FOR MANUFACTURING AN HERB TEA FROM THE LEAVES OF GINKO, PERSIMMON AND PINE

Kwon J. Kang, 807-3 Bangbae-Dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Aug. 14, 1985, Ser. No. 765,534
Int. Cl.[4] A23F *3/34*
U.S. Cl. 426—597 **7 Claims**

1. A process for preparing a nutrient herb tea extract which comprises:

(a) providing a predetermined quantity of leaves from the genus Ginko, Persimmon and Pine in an aqueous environment to form an initial mixture said predetermined quantity of leaves from the genus Ginko, Persimmon and Pine being present in an amount of about 70%, 20% and 10% by weight, respectively;

(b) soaking the initial mixture in water at a temperature of about 15° C. for three hours;

(c) heating the mixture in a pressure pot at a temperature of about 100°–130° C. for about 10–15 minutes; and

(d) filtrating the aqueous mixture to produce said extract.

4,683,141

DEHYDRATED VEGETABLES

Victor M. Lewis, and David A. Lewis, both of Rushcutters Bay, Australia, assignors to Byron Agricultural Company, Pty, Limited, Rushcutters Bay, Australia

Continuation of Ser. No. 607,033, May 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 315,723, Oct. 28, 1981, Pat. No. 4,447,460, which is a continuation-in-part of Ser. No. 165,294, Jul. 2, 1980, abandoned. This application Mar. 2, 1986, Ser. No. 837,319

Claims priority, application Australia, Jul. 11, 1979, PD9542

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[4] A23L *1/212, 3/34*

U.S. Cl. 426—639 9 Claims

1. A dehydrated vegetable product containing 3–15% sodium chloride, not more than about 17% sugar and 6–25% water and having a water activity level of 0.45 to 0.85 at 20° C., said product containing no other additives other than flavorings, coloring substances, seasonings, preservatives, salts, nutritional supplements and anti-oxidants.

4,683,142

RESORPTIVE SHEET MATERIAL FOR CLOSING AND HEALING WOUNDS AND METHOD OF MAKING THE SAME

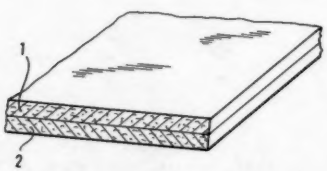
Eberhard Zimmermann, Am Braaken 16, 4400 Münster-Nienberge, and Michael Stroetmann, Kaiser-Wilhelm-Ring 36, 4400 Münster, both of Fed. Rep. of Germany

Division of Ser. No. 486,580, Apr. 19, 1983, Pat. No. 4,606,337. This application Aug. 13, 1986, Ser. No. 896,160

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214337

Int. Cl.[4] A61L *15/00;* A01N *1/02*

U.S. Cl. 427—2 8 Claims



1. A method of making a resorptive sheet material for closing and healing wounds, consisting essentially of a glycoprotein matrix containing substances which cause and, respectively, are conducive to the coagulation of blood, including fibrinogen and thrombin, wherein the sheet material is dry and of multi-layered structure; at least one layer is free from thrombin and contains in the glycoprotein matrix thereof, the fibrinogen in a substantially homogeneously distributed form; and at least one further layer is free from fibrinogen and contains in the glycoprotein matrix thereof the thrombin in a substantially homogeneously distributed form; which process comprises adding fibrinogen to a thrombin-free, predominantly aqueous solution or suspension of the glycoprotein and processing said solution or suspension to form a sheet material layer; and applying onto the full surface of this layer at least one further layer which, in its turn, has been obtained from a further layer, fibrinogen-free and thrombin-containing solution or suspension of the same or of another glycoprotein.

4,683,143

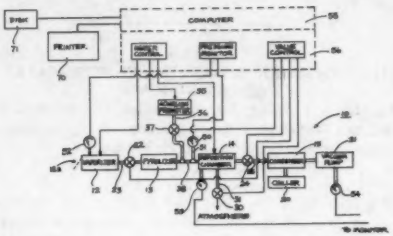
METHOD AND APPARATUS FOR AUTOMATED POLYMERIC FILM COATING

John A. Riley, 905 Richmar Dr., Westlake, Ohio 44145

Filed Apr. 8, 1986, Ser. No. 849,473

Int. Cl.[4] B05C *15/00;* B05D *5/12*

U.S. Cl. 427—8 9 Claims



1. A method for conducting a vapor phase deposition process comprising the steps of:

(a) placing a workpiece within a deposition chamber and evacuating the deposition chamber;

(b) vaporizing a dimer in a vaporizer chamber;

(c) cleaving the dimer in a pyrolizer chamber to produce a reactive vapor;

(d) condensing the reactive vapor onto a workpiece in the evacuated deposition chamber;

(e) generating control signals for routing said vapor from the vaporizer chamber to the pyrolizer chamber and then to the deposition chamber;

(f) controlling vapor pressures as vapor is routed from the pyrolizer chamber to the deposition chamber by controlling vapor temperature; and

(g) monitoring progress of the deposition process to apprise an operator of the status of the process; said monitoring step comprising the substeps of:

(i) depicting the vaporizing chamber, pyrolizer chamber and deposition chamber and conduits connecting said chambers on a viewing screen;

(ii) periodically sensing temperatures of at least some of said chambers and conduits, tabulating said temperatures on the viewing screen, comparing said temperatures with predetermined upper and lower limits, and indicating whether the temperatures fall within the limits;

(iii) periodically sensing pressures within one or more of said chambers and conduits and tabulating said pressures on the viewing screen; and

(iv) presenting one or more indicators on the viewing screen co-ordinated with the generation of the control signals to indicate a progression of the vapor phase deposition process through a number of stages.

4,683,144

METHOD FOR FORMING A DEPOSITED FILM

Yukuo Nishimura, Sagamihara; Ken Eguchi; Hiroshi Matsuda, both of Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,133

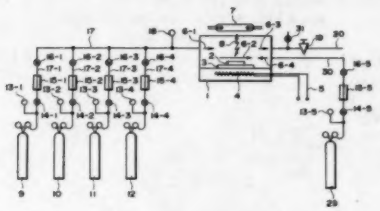
Claims priority, application Japan, Apr. 16, 1984, 59-76126; Apr. 16, 1984, 59-76127; Apr. 16, 1984, 59-76130; Apr. 16, 1984, 59-76131

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—35 9 Claims

1. A photolytic method for forming a deposited film, which comprises forming a gaseous atmosphere of a silane compound represented by the general formula: $Si_nH_{2n+2}(n \geqq 1)$ and a halogen compound selected from the group comprised of Cl_2,

Br_2, I_2 and F_2, in a deposition chamber in which a substrate is arranged, and exciting and decomposing these compounds by utilization of photoenergy thereby to form the deposited film



containing silicon atoms on said substrate whereby the deposited film may be formed at substrate temperatures on the order of about 50° to 150° C., and without application of thermal energy to excite and decompose the compounds.

4,683,145

METHOD FOR FORMING DEPOSITED FILM

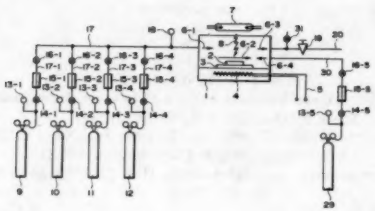
Yukuo Nishimura, Sagamihara; Ken Eguchi; Hiroshi Matsuda, both of Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,134

Claims priority, application Japan, Apr. 16, 1984, 59-76128; Apr. 16, 1984, 59-76129; Apr. 16, 1984, 59-76132; Apr. 16, 1984, 59-76133; Apr. 16, 1984, 59-76134; Apr. 16, 1984, 59-76135

Int. Cl.⁴ B05D *3/06*

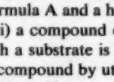
U.S. Cl. 427—36 **16 Claims**



1. A method for forming a deposited film, which comprises forming a gaseous atmosphere of at least one silicon compound moiety selected from the group consisting of: (i) a compound of formula A and a halogen gas; (ii) a compound of formula B; or (iii) a compound of formula C, in a deposition chamber in which a substrate is arranged, and exciting and decomposing said compound by utilization of light energy thereby to forma deposited film containing silicon atoms on said substrate, wherein (a) formula A is

(A)

wherein l represents 3, 4 or 5; and R represents H or SiH_3; (b) formula B is



(B)

wherein R^1 and R^2 independently represent H or an alkyl group having 1 to 3 carbon atoms; m an integer of 3 to 7; and n an integer of 1 to 11; and (c) formula C is

(C)

wherein R^1 and R^4 independently represent a phenyl or naphthyl group which may be substituted with halogens, or an alkyl group having 1 to 11 carbon atoms; R^2 and R^3 independently represent H or CH_3; and p represents an integer of 3 to 7.

4,683,146

PROCESS FOR PRODUCING DEPOSITION FILMS

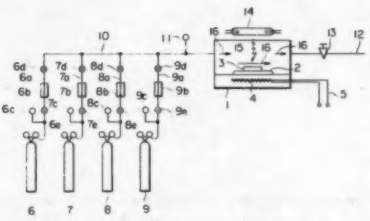
Yutaka Hirai, Tokyo; Hiroshi Matsuda; Ken Eguchi, both of Yokohama; Masahiro Haruta, Funabashi; Yukuo Nishimura, Sagamihara, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,467

Claims priority, application Japan, Apr. 16, 1984, 59-74932; Apr. 16, 1984, 59-74933; Apr. 16, 1984, 59-74934; Apr. 16, 1984, 59-74935; Apr. 16, 1984, 59-74936; Apr. 16, 1984, 59-74937

Int. Cl.⁴ B05D *3/06*

U.S. Cl. 427—54.1 **22 Claims**



1. A photolytic process for producing a deposition film which comprises forming a gaseous atmosphere of at least one silicon hydride compound selected from the group consisting of

(A) straight chain silicon hydrides represented by the general formula

wherein n is an integer of 5 or more;

(B) cyclic silicon hydrides unsubstituted or substituted by a linear or branched silicon hydride radical which are represented by the general formula

wherein m is 3, 4, 5 or 6; and

(C) branched chain silicon hydrides represented by the general formula

wherein p is an integer of 5 or more and q is an integer of 12 or more;

in a chamber having a substrate, and exerting light energy on the atmosphere to excite and decompose the silicon hydride compound, thereby forming a silicon-containing film on the substrate, whereby the film forming may be carried out at a substrate temperature on the order of about 50° to 150° C. and without application of thermal energy to excite and decompose the compounds.

4,683,147

METHOD OF FORMING DEPOSITION FILM

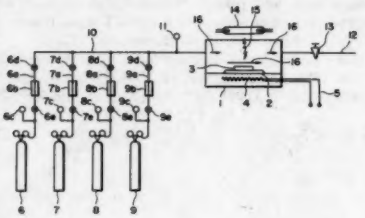
Ken Eguchi; Hiroshi Matsuda, both of Yokohama; Masahiro Haruta, Funabashi; Yukuo Nishimura, Sagamihara; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,468

Claims priority, application Japan, Apr. 16, 1984, 59-74922; Apr. 16, 1984, 59-74923; Apr. 16, 1984, 59-74924; Apr. 16, 1984, 59-74925; Apr. 16, 1984, 59-74926; Apr. 16, 1984, 59-74927; Apr. 16, 1984, 59-74928; Apr. 16, 1984, 59-74929; Apr. 16, 1984, 59-74930; Apr. 16, 1984, 59-74931; Apr. 16, 1984, 59-76136; Apr. 16, 1984, 59-76137

Int. Cl.[4] B05D 3/06

U.S. Cl. 427—54.1 20 Claims



1. A photolytic method of forming a silicon-containing film deposited on a substrate, comprising the steps of forming a gaseous atmosphere of at least one silicon compound selected from the group consisting of compounds represented by general formulas (A), (B), (C), (D), (E) and (F) in a deposition chamber containing the substrate, and applying light energy to the compound sufficient to excite and decompose the compound and to deposit a film while maintaining a pressure of 0.01 to 100 Torr during the forming of said film, whereby the film may be deposited at a substrate temperature on the order of about 50° to 150° C. and without application of thermal energy to excite and decompose the compounds:

(A) $Si_nH_mX_l$ (wherein X is a halogen atom, n is an integer of not less than 3, and m and l are integers of not less than 1 respectively, $m+l=2n$ if l is an integer of not less than 2, a plurality of X's may represent different halogen atoms) representing a cyclic silicon compound;

(B) Si_aX_{2a+2} (wherein X is halogen atom and a is an integer of 1 to 6) representing a chain halogenated silicon compound;

(C) Si_bX_{2b} (wherein x is a halogen atom and b is an integer of 3 to 6) representing a cyclic halogenated silicon compound;

(D) $Si_cX_dY_e$ (wherein X and Y are different halogen atoms, c is an integer of 3 to 6, d and e are integers of not less than 1, and $d+e=2c$) representing a cyclic halogenated silicon compound;

(E) $Si_fX_gY_h$ (wherein X and Y are different halogen atoms, f is an integer of 1 to 6, g and h are integers of not less than 1, and $g+h=2f+2$) representing a chain halogenated silicon compound; and

(F) $Si_iH_jX_k$ (wherein X is a halogen atom, i, j and k are integers of not less than 1, and $j+k=2i+2$) representing a silicon compound.

4,683,148

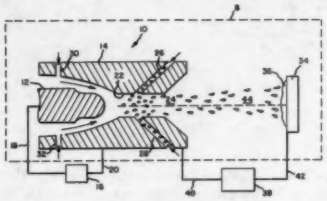
METHOD OF PRODUCING HIGH QUALITY PLASMA SPRAY DEPOSITS OF COMPLEX GEOMETRY

John R. Rairden, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 5, 1986, Ser. No. 859,536

Int. Cl.[4] C23C 15/00

U.S. Cl. 427—34 6 Claims



1. The method of forming a dense deposit over a receiving surface of complex geometry

which comprises

directing a first plasma gun at a first aim point on said receiving surface of complex geometry to deposit material processed through said first gun onto a first portion of said receiving suface,

simultaneously directing a second plasma gun at a different aim point of said receiving surface to deposit like material processed through said second gun onto a second portion of said receiving surface.

the plasma flames from said two guns overlapping in a non-planar surface region between said aim points,

the axes of said gun being at an angle to each other of greater than 20°, and

said aim points being separated onto opposite or confronting surfaces of said complex geometry.

4,683,149

FILM FORMING PROCESS

Yasuo Suzuki, and Yasunori Ando, both of Otsu, Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

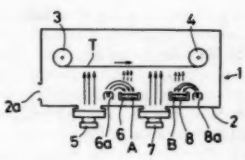
Division of Ser. No. 653,685, Sep. 21, 1984, Pat. No. 4,622,919.

This application May 6, 1986, Ser. No. 860,119

Claims priority, application Japan, Dec. 29, 1983, 58-249803

Int. Cl.[4] B05D 3/06

U.S. Cl. 427—38 6 Claims



1. A process for forming a film of predetermined thickness on a substrate in a vacuum chamber comprising the steps of:

(i) activating the surface of the substrate by exposing the surface to ions at an accelerating voltage of 500 V to 5 kV,

(ii) forming a base deposition layer on the activated substrate surface by vapor deposition, the base deposition layer having a thickness not larger than the depth to which ions can be implanted in the layer, and

(iii) implanting ions in the deposition layer at an accelerating voltage of 10 kV to 100 kV;

the process, when required, further including

(iv) subjecting, a desired number of times, the resulting deposition layer to

(v) the step of vapor deposition or ion plating, and/or
(vi) said steps (ii) and (iii),
to form at least one layer over the deposition layer.

4,683,150
COMPOSITION FOR SEALING SLIDING CONTACT SECTION

Katsumi Hirao, 21-17, Terada-cho, Ibaraki-shi, Osaka, and Toshio Miyake, 7-10-403, 1-chome, Okuda, Okayama-shi, Okayama, both of Japan

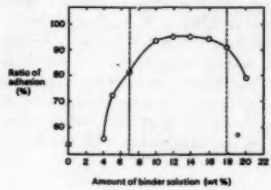
Division of Ser. No. 706,920, Feb. 28, 1985, Pat. No. 4,579,259, which is a continuation of Ser. No. 495,082, May 17, 1983, abandoned. This application Mar. 14, 1986, Ser. No. 839,572
Int. Cl.[4] B05D *7/22;* **C08L** *3/00*
U.S. Cl. 427—239 **10 Claims**

1. In a method for sealing a sliding contact section, comprising filling such sliding contact section with a sealing composition in an amount effective to seal the sliding contact section, the improvement wherein said sealing composition consists essentially of:
(a) 1 part by weight of a polysacchiaride consisting substantially of repeating maltotriose units and having an average molecular weight in the range of 10,000–10,000,000; and
(b) 5–200 parts by weight of a polyol bearing 2–20 carbon atoms and 2–20 hydroxyl groups.

4,683,151
METHOD FOR APPLICATION OF REFRACTORY SPRAY MATERIAL

Setsunori Hamaguchi, and Sumio Hanaoka, both of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Filed Oct. 21, 1985, Ser. No. 789,795
Claims priority, application Japan, Oct. 31, 1984, 59-230938
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—397.8 **1 Claim**



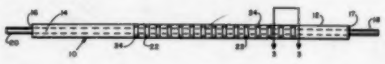
1. A method for the application of a refractory spray material prepared by mixing a spray powder comprising 100 parts by weight of a refractory aggregate of an adjusted grain size and 0.1–3 parts by weight of a curing accelerator with 0.5–5 parts by weight of a wetting agent added thereto, which method is characterized by performing said application spraying with a nozzle while admixing said mixture with a sodium silicate solution as a binder having a viscosity in the range of 3–10 cPs at 15 degrees centigrade and containing 2–8% by weight of Na_2O and 8–20% by weight of SiO_2 at a position in front of an orifice of the nozzle.

4,683,152
APPLICATION EQUIPMENT FOR UNIFORM APPLICATION OF WATER-BASED CEMENTS

James J. Moran, Sugar Land, Tex., and Russell S. Boyes, Baton Rouge, La., assignors to NALCO Chemical Company, Oak Brook, Ill.

Filed Jan. 31, 1986, Ser. No. 824,880
Int. Cl.[4] B05D *1/28*
U.S. Cl. 427—428 **1 Claim**

1. An improved process for applying water-based tire tread adhesive to tire stock, said process being of a type comprising drive means for conveying said rubber stock to a Lick Roll adhesive applicator adapted to apply said adhesive to said rubber stock, the improvement which comprises providing a supply of tire tread adhesive to a roller applicator located ahead of the Lick Roll, which roller applicator bypasses contact of the tire stock with the Lick Roll, said roller applicator being characterized as comprising a tube having throughout its length a bore adapted to receive a supply of water-based



tire tread adhesive, said roller applicator having about its surface a series of parallel spaced-apart grooves which are perpendicular to the length of the tube and which grooves contain holes communicating with the bore, and a porous fabric cover fitted around the outside of the tube, said cover being in communication with said supply of tire tread adhesive and saturated by the water-based tire tread adhesive; and transferring the tire adhesive to the tire stock.

4,683,153
TRANSPARENT LAMINATED POLARIZING GLASSES

Serge P. P. Goepfert, Avon; Serge A. M. Renault, Montigny sur Loing; Francoise M. M. Roger, Avon; Jean-Pierre Themont, Montigny sur Loing, and Andre J. Vachet, La Genevraye, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 20, 1986, Ser. No. 831,311
Claims priority, application France, Aug. 13, 1985, 85 12322
Int. Cl.[4] C09K *19/00;* **B32B** *17/00*
U.S. Cl. 428—1 **10 Claims**

1. A method for fabricating a transparent laminated polarizing glass consisting of a support of an inorganic or organic glass, a coating exhibiting polarizing properties disposed on one of the surfaces of the support, and an optically transparent layer adhered to the coating exhibiting polarizing properties and which protects the coating from humidity, said method comprising the following steps:
(a) forming parallel microgrooves in a surface of the inorganic or organic glass support prior to applying the polarizing coating thereon with the help of a slightly abrasive brushing of the support;
(b) carefully washing and drying that surface of the support prior to applying the polarizing coating thereon;
(c) depositing on that washed and dried surface of the support a mixture of three organic colorants corresponding to the three primary colors and exhibiting a nematic state;
(d) treating the resultant polarizing coating to reduce the water solubility of the coating by immersing into an aqueous solution of inorganic salts having an acid pH;
(e) treating the resultant product of Step (d) above with an aqueous solution free of organic co-solvent prepared from at least one compound chosen from among gamma-aminopropyltrimethoxysilane and gamma-aminopropyltriethoxysilane, the silane representing 0.1–10% by volume of the solution and the aqueous solution having a pH in the range of 10–11.2, this treatment being followed by a rinsing in water and a heat treatment between 80°–140° C.;
(f) placing the resultant product of Step (e) above in contact with an aqueous solution of an epoxyalkyltrialkoxysilane and then rinsing in water followed by a condensation and/or partial polymerization of the epoxyalkyltrialkoxysilane; and
(g) applying an optically transparent, inorganic or organic protective layer to form a barrier against humidity, that application requiring a heat treatment at elevated temperature or irradiation with ultraviolet rays.

10. A transparent laminated polarizing glass produced in accordance with claim 1.

4,683,154

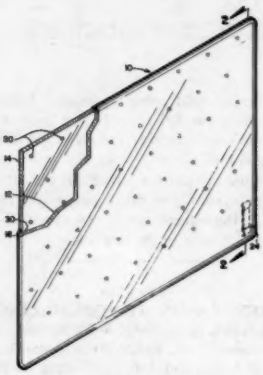
LASER SEALED VACUUM INSULATION WINDOW

David K. Benson, and C. Edwin Tracy, both of Golden, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 19, 1985, Ser. No. 767,218

Int. Cl.[4] E06B *3/24, 7/12;* B32B *17/00*

U.S. Cl. 428—34 **19 Claims**



1. A thermal resistant panel comprising two panes of glass positioned closely spaced apart in substantially parallel relation to each other, a plurality of spherical glass bead spacers positioned between said two panes of glass to maintain the spacing while minimizing the thermal conduction between said panes, and a continuous glass joint around the periphery of said panel sealing the edges of said two panes together.

4,683,155

DOMESTIC CONTAINER WITH HANDLE ATTACHED BY GLUING

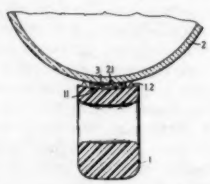
Rudolf Majthan, Eschborn, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 723,994

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415120

Int. Cl.[4] B27N *5/02;* B65D *23/12;* A47G *19/14*

U.S. Cl. 428—35 **11 Claims**



1. Domestic container with a handle fastened by gluing, characterized by the fact that contact area (**1.1**) of handle (**1**) as well as contact area (**2.1**) of container wall (**2**) is smooth and closed, and by the fact that contact area (**1.1**) of the handle comprises formed spacing strips or projections (**1.2**) whose height corresponds to the thickness of adhesive layer (**3**), the entire periphery of said adhesive layer (**3**) being exposed to open air.

4,683,156

FLEXIBLE BLANKET

Charles M. Waters, Holly Cottage, Church Lane, Wroxham, Norfork, United Kingdom

Filed Apr. 11, 1986, Ser. No. 850,862

Int. Cl.[4] B32B *3/14;* E02B *3/12*

U.S. Cl. 428—52 **12 Claims**

1. A flexible blanket for protection or stabilization of underwater structures and pipe lines, unstable beds and embankments,

said blanket comprising at least one layer,

said layer comprising a plurality of separate and distinct block members spaced one from another,

each separate block member having a top and bottom, and a median zone disposed between said top and bottom,

each separate block member having a cross-section taken substantially perpendicular to the height dimension of the segment, which is a regular polygon, which cross-section has a maximum at said median zone and a minimum at at least one of said top and bottoms,

each separate block member tapering substantially regularly from said maximum cross-section to said minimum cross-section; and

means flexibly securing each said block member to a plurality of other adjacent block members to form a layer one block member in height, such that each block member lies substantially contiguous to all its adjacent block members, at said median zone, such that the layer at the median zone is substantially continuous and flexible,

said securing means securing each block member to its adjacent block member in the region of their respective median zones, said securing means being substantially flexible to allow said block members to pivot relative to one another insofar as the tapers of the block members permit; the arrangement of the tapers being such that each block member may pivot in at least two directions, said directions being mutually non perpendicular.

4,683,157

THIXOTROPIC COATING COMPOSITIONS AND METHODS

Mark F. Mosser, 485 Washington Ave., Sellersville, Pa. 18960, and William J. Fabiny, 1105 Continental Dr., Harleysville, Pa. 19438

Division of Ser. No. 441,754, Nov. 15, 1982, Pat. No. 4,548,646. This application Sep. 18, 1985, Ser. No. 777,364

Int. Cl.[4] B32B *3/02, 15/08*

U.S. Cl. 428—65 **9 Claims**

1. A part coated with a cured coating composition which comprises (a) an acid binder aqueous solution which comprises phosphate ions and ions of the group of chromate ions or molybdate ions, (b) an acid-stable amorphous silica, and (c) a non-ionic surfactant, said silica being crosslinked with said surfactant.

4,683,158

CARPET HAVING BOTTOM PORTIONS OF PILE COVERED WITH CARBON BLACK CONTAINING RESIN

Toshio Yasuoka, Osaka, Japan, assignor to Teijin Limited, Osada, Japan

Continuation of Ser. No. 724,335, Apr. 17, 1985, abandoned.
This application Apr. 23, 1986, Ser. No. 854,816
Claims priority, application Japan, Apr. 25, 1984, 59-81905
Int. Cl.[4] B32B 3/02, 33/00
U.S. Cl. 428—95 6 Claims

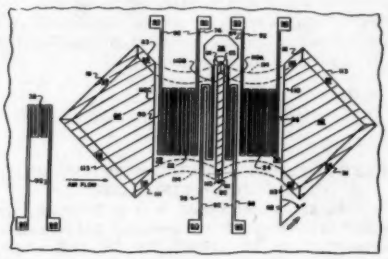
1. A carpet having a base fabric, pile yarns tufted to said base fabric and and a backing layer covering a back surface of said base fabric, said backing layer comprising an olefinic polymer, said pile yarns having portions which extend into said backing layer, such portions being substantially covered with resinous material containing from 0.005 percent to 10% by weight of finely divided carbon black, said pile portions being in direct contact with the carbon black-containing resinous material.

4,683,159

SEMICONDUCTOR DEVICE STRUCTURE AND PROCESSING

Philip J. Bohrer, Minneapolis; Robert E. Higashi, Bloomington, and Robert G. Johnson, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 798,725, Nov. 18, 1985, abandoned, which is a continuation of Ser. No. 634,087, Jul. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 429,598, Sep. 30, 1982, Pat. No. 4,501,144. This application Jun. 17, 1986, Ser. No. 876,651
Int. Cl.[4] B32B 3/14; B44C 1/22; C03C 25/06
U.S. Cl. 428—138 14 Claims



8. An composite semiconductor device, comprising:

a semiconductor body with a first surface having a predetermined orientation with respect to a crystalline structure in the semiconductor body, the semiconductor body having a depression formed into the first surface of the body;

a layer of thin film material covering at least a portion of the first surface; and

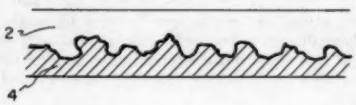
a thin film member comprising the layer of material, the member having a predetermined configuration bridging the depression, the member being connected to the first surface at substantially opposing ends of the predetermined configuration, the depression opening to the first surface along an edge on each side of the member, the layer of material comprising first and second openings, the first opening being bounded in part by one edge of the member, the second opening being bounded in part by the other edge of the member, both openings also being bounded in part by a boundary connected to an edge of the member, at least one of the boundaries having a predetermined boundary configuration formed so that, when an anisotropic etch is placed on the openings to undercut the member and form the depression, there will be no substantial undercutting of the semiconductor body below the thin film material at the predetermined boundary configuration.

4,683,160

SOLAR CELLS WITH CORRELATED ROUGHNESS SUBSTRATE

Aaron N. Bloch, Bridgewater, and Ping Sheng, Skillman, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 9, 1985, Ser. No. 732,145
Int. Cl.[4] B32B 3/30; H01L 31/00
U.S. Cl. 428—141 6 Claims



1. A photoconductive device comprising an

active layer of semiconductor material having a pair of opposed surfaces,

one of said surfaces of said active layer textured with microstructures, said microstructures corresponding to the Fourier transform of the structure factor S(k), where S(k) has been chosen to maximize

$$\int_{\omega_-}^{\omega_+} F(\omega_k)d\omega_k$$

where

$$F(\omega_k)=I(\omega_k)A(\omega_k)S(k)N(\omega_k)$$

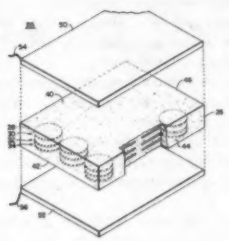
$F(\omega_k)$=absorbed light intensity;
$I(\omega_k)$=intensity of incident light;
$A(\omega_k)$=absorption of light by the semiconductor;
$N(\omega_k)$=density of guided mode state;
ω_k=frequency of guided mode of wave-vector k;
ω_{31}, ω_+=limits of the frequency range of interest.

4,683,161

CERAMIC BODY WITH ORDERED PORES

Roy W. Rice; Manfred Kahn, both of Alexandria, Va., and Damian E. Shadwell, Oxon Hill, Md., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Filed Feb. 28, 1985, Ser. No. 706,580
Int. Cl.[4] B32B 3/12, 18/00
U.S. Cl. 428—178 18 Claims



1. A ceramic body comprising: a first ceramic portion; and a second ceramic portion integrally connected to said first portion; each of said first and second portions having a plurality of substantially flat pores in predetermined order, size, shape, orientation and location in at least one discrete plane which provide an anisotropic ceramic body.

4,683,162

MICA PRODUCT

Dennis J. Sklarski, Deerfield, and Arthur F. Doyle, Portsmouth, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 9, 1986, Ser. No. 849,936
Int. Cl.[4] B32B *3/28*
U.S. Cl. 428—182 6 Claims

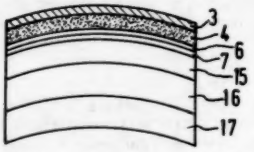
1. A flexible mica insulation comprising one or more layers of mica paper impregnated with about 5 percent about 25 percent by weight of a flexible silicone resin binder, said binder containing about 1 percent to about 4 percent by weight of an monoalkoxy titanate and about 0.5 percent to about 2 percent by weight of a naphthenate wherein the mica insulation has improved moisture resistance, excellent flexibility and conformability.

4,683,163

VITREOUS SEMICONDUCTOR SUPPORTING STRUCTURE AND DEVICE REALIZED WITH SUCH A STRUCTURE

Philippe Jarry, Sucy-en-Brie; Mohamed L. Haji, Lannion; Pierre Guittard, Montlhery Longpont; Bernard Guillemet, Vitry-sur-Seine, and Claude Piaget, Montgeron, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1984, Ser. No. 661,501
Claims priority, application France, Oct. 19, 1983, 83 16636
Int. Cl.[4] D32B *17/06*; C03C *3/14*
U.S. Cl. 428—209 8 Claims



1. In combination, a vitreous support structure and a plurality of layers bonded to and supported on said support structure, said supported layers including at least one semiconductor layer consisting essentially of an n-ary III-V compound and at least one complementary layer, characterized in that:

(a) the at least one semiconductor layer has a coefficient of expansion which is higher than that of the at least one complementary layer; and

(b) the vitreous support structure comprises an arrangement of supporting layers for limiting thermally-developed stresses in the at least one semiconductor layer over a temperature range extending from ambient to the highest manufacturing temperature to which the combination is subjected, said arrangement of supporting layers including:

(1) a first glass layer having a coefficient of expansion which is higher than the coefficient of expansion of the at least one complementary layer, and having a softening temperature which is higher than said highest manufacturing temperature; and

(2) a second glass layer disposed between the first glass layer and the supported layers, said second glass layer having a softening temperature which is lower than the softening temperature of the first glass layer.

4,683,164

NONWOVEN FOR MANUFACTURING FLAMEPROOF ROOFING SHEETS

Franz Kaulich, Bobingen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,787
Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418790
Int. Cl.[4] B32B *27/34*
U.S. Cl. 428—287 4 Claims

1. A nonwoven for manufacturing flameproof roofing sheets comprising a fleece of meltable synthetic fibers or filaments finished with a formulation which, at temperatures above 220° C., reacts to form a fire resistant, foam-like, substantially continuous layer.

4,683,165

BINDER FOR FIBERS OR FABRICS

Martin K. Lindemann, Greenville, and Kim Deacon, Rockhill, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 753,685, Jul. 10, 1985, Pat. No. 4,616,057. This application Sep. 2, 1986, Ser. No. 902,696
The portion of the term of this patent subsequent to Oct. 10, 2003, has been disclaimed.
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—290 18 Claims

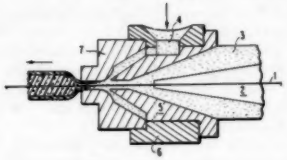
1. A nonwoven product comprising a fiber or fabric bound by a binder comprising an aqueous polymer emulsion containing a first polymer network containing an active crosslinking agent which is intertwined on a molecular scale with a second polymer network, wherein the second polymer differs from the first polymer and the first polymer comprises 5 to 95% on a solids by weight basis of the emulsion.

4,683,166

FOAMED PLASTIC INSULATED WIRE AND METHOD FOR PRODUCING SAME

Masso Yuto, and Yoichi Suzuki, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 335,315, Dec. 29, 1981, which is a continuation of Ser. No. 970,021, Dec. 14, 1978
This application Apr. 1, 1986, Ser. No. 846,487
Claims priority, application Japan, Dec. 16, 1977, 52-150600
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—314.8 6 Claims



1. A foamed plastic insulated wire comprising a foamed plastic material insulation layer formed over a conductor, said plastic material consisting essentially of a foamed low density polyethylene made from (a) a foamable low density polyethylene having a melt flow swelling ratio greater than 55%, and (b) a chemical blowing agent, an inert gas blowing agent, or a combination thereof, said foamed low density polyethylene comprising at least 20% by weight of said insulation layer, and having a cell size of 50 microns or less.

4,683,167

MAGNETIC IRON OXIDE PIGMENT AND RECORDING MEDIA

Lawrence M. Scott, Newark, and Gary D. Rexroat, Oakland, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Jun. 25, 1984, Ser. No. 623,910
Int. Cl.[4] G11B 5/706
U.S. Cl. 428—328 17 Claims

1. A magnetic recording medium having superior saturation magnetization properties comprising:

a magnetic particulate pigment, with superior saturation magnetization, comprising a magnetic core and an epitaxial coating, wherein said coating comprises an inner layer of cobalt(II) hydroxide enveloped by an outer layer of iron(II) hydroxide,

at least one of said layers impregnated with a saturation magnetization enhancing amount of zinc ion.

4,683,168

METHOD OF PRODUCING A COMPOSITE BODY

George B. Hares, and David L. Morse, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 690,172, Jan. 10, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,276
Int. Cl.[4] B32B 17/06, 17/10
U.S. Cl. 428—335 10 Claims

1. A composite comprising:

(a) a substrate of glass or glass-ceramic having one or more differentially etchable components, the crystals of said glass-ceramic having an average size less than about 5 microns, and said substrate having an etched surface resulting from the differential etching of said surface; the etched surface on said substrate extending to a depth of between about 500–4000 Å with interconnected pores of relatively uniform diameters of about 50–30,000Å relatively homogeneously dispersed throughout the etched surface; and

(b) a non-stick, heat resistant resin bonded to said etched surface through diffusion-type adhesive interaction on a molecular scale, said resin having a thickness of at least about 15 microns.

2. The composite of claim 1 wherein the non-stick, heat resistant resin ranges from about 15 to 30 microns in thickness.

4,683,169

METHYL METHACRYLIC COATINGS ON THERMOPLASTIC FILM

Herbert L. Curry, Mount Vernon, and Earl T. Crouch, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 4, 1985, Ser. No. 794,873
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] B32B 27/36
U.S. Cl. 428—337 5 Claims

1. A UV stable article comprising a film substrate of polycarbonate having a thickness of from about 1 to about 60 mils, and a microcrack resistant protective external coat comprising a copolymer consisting essentially of:

(a) methyl methacrylate units,

(b) from about ¼ percent up to about 10 percent by number of other methacrylate units selected from the group consisting of ethyl methacrylate, n-butyl methacrylate, i-butyl methacrylate, or mixtures thereof, and

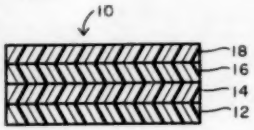
(c) from 0 percent up to 5 percent by number of other alpha-beta ethylenically unsaturated units; wherein said units are combined in such ratio to result in a copolymer material having a tensile elongation at break of greater than about 3.5 percent and a glass transition temperature greater than about 87° C.

4,683,170

NYLON COPOLYMER AND NYLON BLENDS AND FILMS MADE THEREFROM

Samuel W. Tse, and Deane E. Galloway, both of Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 626,415, Jun. 29, 1984. This application Jan. 21, 1986, Ser. No. 820,350
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—349 41 Claims



1. A multiple layer film having two surfaces and comprising a first heat sealable layer on one surface thereof and a second nylon layer on the other surface thereof, and wherein the composition of said nylon layer is a blend of 40% to 75% by weight nylon 6 and 60% to 25% by weight of a nylon copolymer wherein the copolymer is 80% to 90% moieties of a first polymer of nylon 6 and 20% to 10% moieties of a second polymer of nylon; the overall composition of the blend comprising 2.5% to 10% moieties of said second polymer of nylon.

4,683,171

LAMINATE AND METHOD FOR ITS PREPARATION

Kazuhiko Kuga; Hiroshi Washita, and Hiroyuki Watanabe, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,545
Claims priority, application Japan, Feb. 5, 1985, 60-19266
Int. Cl.[4] A61F 13/04; B05D 3/06; B32B 27/40; C08G 18/10
U.S. Cl. 428—354 61 Claims

1. A transparent laminate made of a transparent hard material having a soft synthetic resin layer on its surface, wherein the soft synthetic resin layer has, at its exposed surface side, a surface of a cross-linked polyurethane type resin having a self-healing property with the surface reformed by impregnating an additionpolymerizable unsaturated compound into the cross-linked polyurethane resin surface and polymerizing the impregnated compound.

32. A pre-laminated sheet of a cross-linked polyurethane type resin having, at one side, a surface reformed by the impregnation and polymerization of an addition-polymerizable unsaturated compound and having a self-healing property and, at the other side, a layer of an adhesive material.

4,683,172

METHOD FOR MAKING SAFETY OR IMPACT RESISTANT LAMINATES

Donald G. LeGrand, Burnt Hills, and William V. Olszewski, Stillwater, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 14, 1984, Ser. No. 640,615
Int. Cl.[4] B32B 27/36, 17/10
U.S. Cl. 428—412 5 Claims

1. A safety or impact resistant optically transparent laminate comprising

(a) a plurality of laminae, at least one of which is a rigid lamina

(b) at least one single interlayer interposed between any two of said laminae

(c) a sufficient number of contact or pressure sensitive adhesive layers to bond all of said laminae and said interlayers, at least one of which adhesive layers is positioned adjacent to at least one of said interlayers.

4,683,173

PROCESS FOR PREPARING A CATIONIC AMINE-STABILIZED LATEX THERMOSETTING ELECTROCOAT COMPOSITION, METHOD OF CATHODIC ELECTROCOATING AND RESULTANT PRODUCT

Kirk J. Abbey, Seville, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed Nov. 4, 1985, Ser. No. 794,722
Int. Cl.[4] B32B 27/00; C08L 75/00
U.S. Cl. 428—425.8 10 Claims

1. In a process for preparing a cationic amine-stabilized electrocoating composition comprising

(a) 95 to 45 weight percent of a thermosetting latex polymer prepared in water by emulsion polymerization of vinyl monomers comprising non-functional monomers, monomers having functional groups adapted to cure with a latent blocked isocyanate and amine functional monomers which when ionized or neutralized with acid impart cationic properties to the latex; and

(b) 5 to 55 weight percent of a non-polymerizable water insoluble blocked isocyanate; wherein (a)+(b) on a solids basis total 100 percent;

the improvement which comprises conducting said emulsion polymerization of said vinyl monomers in the presence of a water insoluble non-polymerizable latent blocked isocyanate by

(1) forming a course preemulsion of a blocked isocyanate in water with a surfactant and either at least a portion of one or more polymerizable monomers or with a non-polymerizable solvent;

(2) homogenizing said course preemulsion to produce a fine emulsion having an average particle size of less than 3 microns; and

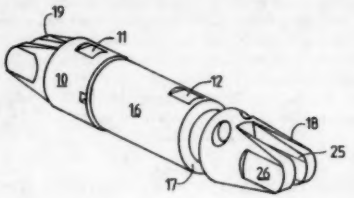
(3) emulsion polymerizing vinyl monomers in a reactor into which the said fine emulsion was previously batch charged or is being continuously fed over some interval of time concomitant with the emulsion polymerization.

4,683,174

RAW CASTING BLANK FOR FLUID ACTUATED RAM ASSEMBLY

Raymond G. Hillier, Queensland, Australia, assignor to Delibes Pty. Ltd., Australia

Filed Oct. 4, 1985, Ser. No. 784,246
Claims priority, application Australia, Oct. 5, 1984, PG7524; Nov. 13, 1984, PG8094; Jun. 14, 1985, PH1034
Int. Cl.[4] B22D 25/02
U.S. Cl. 428—583 7 Claims



1. A raw casting for a fluid actuated ram assembly comprising

(i) a rear portion having a bifurcated end; and

(ii) a barrel portion including an internal bore; and

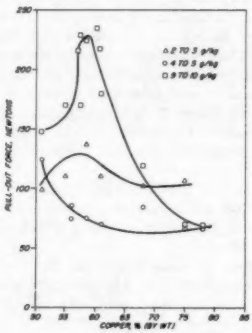
(iii) a front portion having a bifurcated end.

4,683,175

PROCESS FOR PRODUCING BRASS-COATED STEEL WIRE FOR THE TIRE CORD APPLICATIONS

Frank W. Bakewell, Washington Township, Westmoreland County, and Charles D. Stricker, Monroeville, both of Pa., assignors to Associated Materials Incorporated, Dallas, Tex.

Continuation of Ser. No. 540,658, Oct. 11, 1983, abandoned.
This application Oct. 25, 1985, Ser. No. 792,173
Int. Cl.[4] B32B 15/20
U.S. Cl. 428—677 15 Claims



1. A process for producing steel wire for tire-cord by the sequential steps consisting essentially of:

(a) applying a brass-coating to said wire, said coating consisting essentially of from about 54 to about 65% copper and from about 46 to about 35% zinc, the weight of said coating being within the range of from about 2.5 to about 13.0 grams of coating per kilogram of said wire,

(b) heating the coated wire to a temperature of at least about 700° F. and not more than a temperature of about 1000° F. for a time sufficient to reduce the hardness of said coating to a value within the range of from about 40 to about 70 on the rockwell B scale, and

(c) drawing the heat-treated wire to a final thickness suffi-

cient to provide a reduction in cross-sectional area of at least about 60 percent,

said heat treatment serving to significantly improve the drawability of said wire and permit a substantially continuous crack-free coating at the final wire thickness to be achieved.

4,683,176

OPTICAL MAGNETIC RECORDING MEMBER

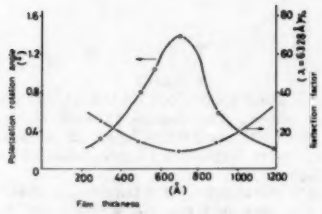
Kyuzo Nakamura; Yoshifumi Ota, and Tsutomu Asaka, all of Yachimatamachi, Japan, assignors to Nihonshinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 15, 1984, Ser. No. 641,119

Claims priority, application Japan, Aug. 15, 1983, 58-148038

Int. Cl.⁴ G11B *7/24*

U.S. Cl. 428—692 **8 Claims**



1. An optical magnetic recording member comprising:

(a) a composite semi-transparent perpendicular-type magnetic film made of a mixture of a ferromagnetic material and a dielectric material;

(b) a reflection film formed on the perpendicular-type magnetic film; and

(c) a transparent substrate for supporting said magnetic film and said reflection film,

wherein the refractive index of the composite semi-transparent perpendicular-type magnetic film is larger than the refractive index of the transparent substrate,

wherein the reflection film is made of a soft magnetic material or a metallic perpendicular-type magnetic film selected from the group consisting of Co—Cr and Tb—Fe.

4,683,177

POWER GENERATION SYSTEM IN FUEL CELL

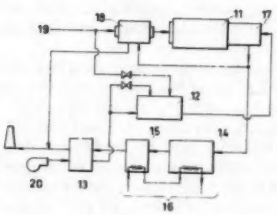
Tomohiro Kinoshita; Seiichi Tanabe, and Eishiro Sasakawa, all of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1986, Ser. No. 889,492

Claims priority, application Japan, Aug. 16, 1985, 60-179330

Int. Cl.⁴ H01M *8/06*

U.S. Cl. 429—26 **1 Claim**



1. A power generation system in a fuel cell having an air preheater for preheating air for a fuel cell reaction which will be fed to an afterburner of a high-temperature solid electrolyte type fuel cell, characterized by disposing, between said air preheater and said afterburner, a combustor for performing an additional combustion after the temperature of the air for the reaction has been elevated by said air preheater.

4,683,178

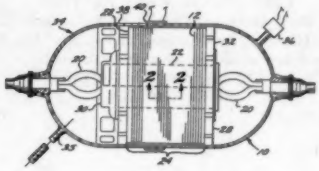
PROCESS FOR PREVENTING ELECTRICAL STORAGE CELL CAPACITY LOSS

Steven J. Stadnick, Redondo Beach, and Howard H. Rogers, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 7, 1986, Ser. No. 827,023

Int. Cl.⁴ H01M *12/06*

U.S. Cl. 429—101 **10 Claims**



1. A process for reducing the capacity loss during storage of a pressurized nickel-hydrogen cell comprising:

precharging the cell prior to storage so that discharge of the cell is negative electrode limited, whereby an electrical charge remains on the nickel positive electrode when the hydrogen partial pressure falls to about 0 psia.

4,683,179

ELECTROCHEMICAL STORAGE CELL

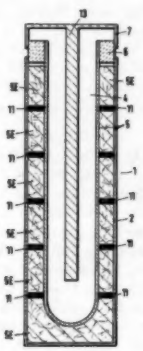
Reinhart Langpape, Schönau; Wolfgang Dörrscheidt, Helmstadt; Jean-Philippe Roze, Wiesloch, and Günther Steinleitner, Schriesheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim/Käfertal, Fed. Rep. of Germany

Continuation of Ser. No. 799,632, Nov. 19, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 935,079

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3442936

Int. Cl.⁴ H01M *10/39*

U.S. Cl. 429—104 **3 Claims**



1. Electrochemical storage cell of the sodium and sulfur type with an anode space and a cathode space which are separated from each other by a solid electrolyte and are bounded, at least in some regions, by a metallic housing, the cathode space containing a sulfur electrode which is made of a sulfur-impreg-

nated graphite or carbon fiber material and the cathode space is subdivided in the region of the lateral boundary surface of the solid electrolyte into at least two sectors which extend parallel to the longitudinal axis of the solid electrolyte and extend along the entire lateral boundary of the solid electrolyte and are separated from each other by spacers which are arranged radially with their narrow sides adjacent ot the solid electrolyte and to the inside surfaces of the metallic housing and the region of the cathode space around the dome of the solid electrolyte is separated from the remaining region of the cathode space by a spacer arranged perpendicularly to the longitudinal axis of the solid electrolyte and wherein all the spacers are made of alpha aluminum oxide.

4,683,180

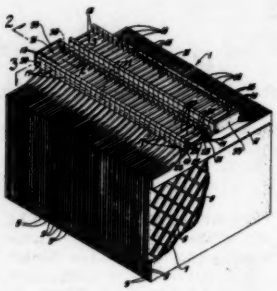
ELECTRIC STORAGE BATTERY

James R. Bish, Anderson; Charles P. McCartney, Jr., Yorktown, and Clarence A. Meadows, Muncie, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 5, 1986, Ser. No. 859,364

Int. Cl.[4] H01M *2/28*

U.S. Cl. 429—130 **12 Claims**



1. In a galvanic cell including a stack of positive and negative polarity, lug-bearing plates alternately interleaved with one another and means for electrically joining aligned plate lugs into sets of like polarity, the improvement comprising:

said lugs each having a root portion proximate said plate and a distal portion more remote from said plate and engaging said means;

a discrete, insulating collar tightly surrounding said root portion of each said lug; and

the collars of said aligned lugs abutting one another so as to space said aligned lugs apart and to insulate said joining means from the plates of opposite polarity.

4,683,181

ELECTROCHEMICAL GENERATOR WITH COMPOSITE ELECTRODE

Michel Armand, Echirolles; Jean-Michel Chabagno, Pau; Philippe Ricoux, Oullins, all of France; Guy Vassort, Longeuil, Canada; Michel Gauthier, Laprairie, Canada; Fernand Brochu, Longeuil, Canada, and Philippe Rigaud, Vienne, France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France and Hydro-Quebec, Quebec, Canada

Filed Apr. 24, 1985, Ser. No. 726,622

Claims priority, application France, Apr. 24, 1984, 8406416

Int. Cl.[4] H01M *10/36, 10/40*

U.S. Cl. 429—192 **16 Claims**

1. An electrochemical generator capable of operating reversibly at ambient temperature, comprising:

(1) a negative electrode;

(2) an electrolyte constituted by a solid solution of at least one salt in solution in a macromolecular material, the said solid solution being constituted to a large extent by an amorphous polyether structure and possessing sufficient ionic conductivity to allow operation of the generator at ambient temperature; and

(3) a composite positive electrode constituted by the agglomeration product of a solid solution of at least one of the said salt in solution in a macromolecular material essentially constituted by an amorphous polyether structure and an electrochemically active material which is at least one metal compound selected from the group consisting of $NiS_{1.75}$, NiS, FeS, CoS_2, and $Cu_4O(PO_4)_2$.

4,683,182

RECHARGEABLE ELECTROCHEMICAL APPARATUS

Toyoguchi Yoshinori, Yao; Junichi Yamaura, Osaka; Tooru Matsui, Moriguchi, and Takashi Iijima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

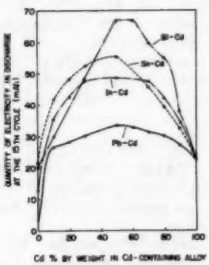
PCT No. PCT/JP84/00086, § 371 Date Nov. 5, 1984, § 102(e) Date Nov. 5, 1984, PCT Pub. No. WO84/03590, PCT Pub. Date Sep. 13, 1984

Continuation of Ser. No. 672,260, Nov. 5, 1984, abandoned. This PCT application Mar. 6, 1984, Ser. No. 873,093

Claims priority, application Japan, Mar. 7, 1983, 58-36877; Mar. 7, 1983, 58-36878; Mar. 7, 1983, 58-36880; Mar. 7, 1983, 58-36881; Aug. 29, 1983, 58-158329

Int. Cl.[4] H01M *10/36, 4/44*

U.S. Cl. 429—194 **9 Claims**



1. A rechargeable electrochemical apparatus comprising a organic electrolyte containing an alkali metal in ionic form, a reversible positive electrode, and a rechargeable negative electrode, said apparatus containing no alkali metal in the metallic state, and said rechargeable negative electrode being comprised of a cadmium alloy,

wherein said cadmium alloy comprises at least 10 percent by weight of Cd and at least one metal selected from the group consisting of Sn, In, Pb and Bi,

wherein said cadmium alloy, as a result of charging said apparatus at a more noble potential than that of the metallic alkali metal, absorbs said alkali metal ions from said electrolyte to form an intermetallic compound therewith which is comprised of at least one metal of said alloy and said alkali metal, without the formation of metallic alkali metal, and

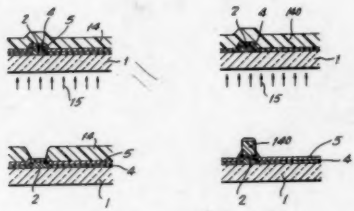
wherein said cadmium alloy, as the result of discharging said apparatus, desorbs said alkali metal from the intermetallic compound into the electrolyte as ions.

4,683,183

METHOD OF MANUFACTURING MIM ELEMENTS IN LIQUID CRYSTAL DISPLAYS

Yoichi Ono, Shiojiri, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,226
Claims priority, application Japan, Jan. 13, 1984, 59-4609
Int. Cl.[4] G02F 1/03
U.S. Cl. 430—20 27 Claims



1. A method of forming a MIM element having a first metal electrode and a second metal electrode with an insulator therebetween in an electro-optic display device having first and second opposed substrates with a liquid crystal material disposed therebetween, said first substrate having at least a first row electrode formed thereon, said second substrate having at least a first column electrode formed thereon, a picture element being defined where said row and column electrodes overlap in top plan view, comprising the step of forming said MIM element having first and second electrodes with an insulator therebetween at the position where said picture element is defined on one of said first and second substrates by a photolithography process using a self-alignment method where the substrate on which said MIM element is formed is exposed from behind with radiation with said first metal electrode acting as a mask.

4,683,184

ELECTROPHOTOSENSITIVE MEMBER HAVING ALTERNATING AMORPHOUS SEMICONDUCTOR LAYERS

Izumi Osawa, Ikeda; Isao Doi, Toyonaka, and Toshiya Natsuhara, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,587
Claims priority, application Japan, Jul. 16, 1984, 59-147920
Int. Cl.[4] G03G 5/082
U.S. Cl. 430—57 13 Claims

1. An electrophotosensitive member which comprises on a conductive substrate, a plurality of amorphous silicon layers and a plurality of amorphous silicon:germanium layers wherein each of said amorphous silicon:germanium layers is interposed between two of said amorphous silicon layers so as not to come into direct contact with the substrate and surface and includes about 2 to 70 atomic % of germanium.

4,683,185

ELECTROPHOTOSENSITIVE MEMBER HAVING A DEPLETION LAYER

Izumi Osawa, Ikeda; Isao Doi, Toyonaka, and Toshiya Natsuhara, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1985, Ser. No. 753,450
Claims priority, application Japan, Jul. 16, 1984, 59-147919
Int. Cl.[4] G03G 5/082
U.S. Cl. 430—57 11 Claims

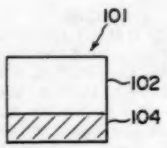
1. An electrophotosensitive member which comprises:
a substrate;
a first layer of amorphous silicon having a thickness of about 5 μm to 30 μm;
a second photoconductive layer of amorphous silicon: germanium formed on said first layer and having a thickness of about 100 angstroms to 20 μm and including a depletion layer of amorphous silicon:germanium; and
a third layer of amorphous silicon formed on said second layer and having a thickness of about 5 μm to 30 μm, said second layer being located at a distance from the surface of the substrate within a range of 20 to 80% of the total thickness of said first, second and third layers.

4,683,186

DOPED AMORPHOUS SILICON PHOTOCONDUCTIVE DEVICE HAVING A PROTECTIVE COATING

Kunio Ohashi; Tadashi Tonegawa, both of Nara; Shoichi Nagata, Yamatokoriyama, and Masatsugu Nakamura, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 706,669, Feb. 28, 1985, Pat. No. 4,632,894.
This application Oct. 10, 1985, Ser. No. 786,046
Claims priority, application Japan, Feb. 28, 1984, 59-39147; Mar. 2, 1984, 59-40938; Mar. 2, 1984, 59-40939; Mar. 5, 1984, 59-42662; Mar. 5, 1984, 59-42663; Mar. 5, 1984, 59-42664; Mar. 14, 1984, 59-49675; Mar. 14, 1984, 59-49676
Int. Cl.[4] G03C 5/08, 5/04
U.S. Cl. 430—84 28 Claims



1. A photoconductive device comprising:
a conductive substrate;
a photoconductive layer made of amorphous Si:H; and
a surface protection layer applied on said photoconductive layer which wll not deteriorate the photosensitivity or charge acceptance of said photoconductive layer;
wherein a dopant is added to said photoconductive layer at least near an interface between said surface protection layer and said photoconductive layer, the concentration of said dopant increasing in a direction perpendicular to and toward said interface, said surface protection layer having an optical energy gap larger than that of said photoconductive layer.

4,683,187

DRY PROCESS ELECTROSTATIC DEVELOPER COMPRISING A GENERALLY ROUND MAGNETIC CARRIER AND A FLAKE-TYPE CARRIER

Amnon Goldstein, 767 Pelhamdale Ave., Pelham, N.Y. 10803, and John F. Cooper, 9 Southwood Dr., Londonderry, N.H. 03053

Continuation-in-part of Ser. No. 674,621, Nov. 26, 1984, abandoned. This application Aug. 9, 1985, Ser. No. 764,417
Int. Cl.[4] G03G 13/09
U.S. Cl. 430—106.6 9 Claims

1. An electrophotographic magnetic brush developer material comprising:
a toner material,
a round magnetic carrier material having a generally round cross section, and
a flake type magnetic carrier material, the proportion of round carrier material to flake carrier material by weight being in the range of from 1:5 to 5:1.

4,683,188

ELECTROPHOTOGRAPHIC TONER CONTAINING METAL COMPLEX CHARGE CONTROL AGENT

Nobuo Suzuki, Shobu; Kikuko Okamura; Genpei Sugiyama, both of Tokyo, and Susumu Suzuka, Yono, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

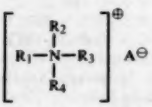
Filed May 14, 1986, Ser. No. 863,170

Claims priority, application Japan, May 28, 1985, 60-113165; Apr. 26, 1986, 61-95876

Int. Cl.[4] G03G 9/08

U.S. Cl. 430—110 **5 Claims**

1. A powdered electrophotographic toner containing a compound having the formula:



(I)

wherein each of R_1, R_2, R_3 and R_4 is a hydrogen atom, an alkyl group having from 1 to 22 carbon atoms, an unsubstituted or substituted aromatic group having from 6 to 20 carbon atoms and an aralkyl group having from 7 to 20 carbon atoms, and $A^{\ominus}$ is a molybdic acid anion, a tungstic acid anion or a heteropolyacid anion containing molybdenum or tungsten atoms.

4,683,189

TONERS FOR SILVER HALIDE DIFFUSION TRANSFER IMAGE WITH SULFO OR CARBOXYL GROUPS

Yoshio Idota, and Morio Yagihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

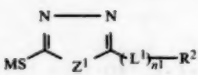
Filed Apr. 21, 1986, Ser. No. 853,835

Claims priority, application Japan, Apr. 19, 1985, 60-83664; Apr. 19, 1985, 60-83665; Apr. 19, 1985, 60-83666

Int. Cl.[4] G03C 5/54, 5/46

U.S. Cl. 430—248 **10 Claims**

1. A method of forming a silver salt diffusion transfer image, comprising: developing an imagewise exposed photosensitive silver halide emulsion layer with a developing agent and a silver halide solvent in the presence of an alkali to thereby convert at least a portion of unexposed silver halide in said emulsion layer to a diffusible silver complex salt and transferring at least a portion of said silver complex salt into a silver precipitating agent-containing image receiving layer to form an image in said image receiving layer, wherein said image is formed in the presence of a compound selected from the group consisting of compounds of the following general formulae (I), (II) and (III):



(I)

wherein Z^1 is a sulfur atom, an oxygen atom or

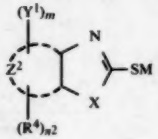
R^3 is a hydrogen atom, a substituted or unsubstituted alkyl group with the proviso that the substituent is not a sulfo or carboxyl group, or a substituted or unsubstituted aryl group with the proviso that the substituent is not a sulfo or carboxyl group;

R^2 is an organic group containing at least one sulfo or carboxyl group;

L^1 is —CONR—, —NRCO—, —SO_2NR—, —NRSO_2—, —OCO—, —COO—, —S—, —NR—, —CO—, —SO—, —SO_2—, —OCOO—, —NRCONR[1]—, —NRCOO—, —OCONR—, or —NRSO_2NR[1]—, wherein R and R^1, which may be the same or different, are selected from a hydrogen atom, an alkyl group or an aryl group;

n^1 is 0 or 1; and

M is a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a quaternary phosphonium group;



(II)

wherein X is

a selenium atom, a sulfur atom or an oxygen atom, wherein R^7 is a hydrogen atom or an alkyl group;

R^4 is a substituent group;

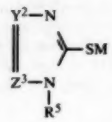
Z^2 is an atomic group necessary to form a carbocyclic or heterocyclic ring;

Y^1 is a carboxyl group or a sulfo group;

M is a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a quaternary phosphonium group;

m is a whole number of 1 to 3; and

n^2 is a whole number of 0 to 2; and



(III)

wherein Y^2 and Z^3, which may be the same or different, are N or CR^6 wherein R^6 is a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group;

R^5 is an alkyl group substituted by at least one of SO_3M^1 or $COOM^1$ group or an aryl group substituted by at least one of SO_3M^1 or $COOM^1$ group;

M and M^1, which may be the same or different, are a hydrogen atom, an alkali metal atom, a quaternary ammonium group or a quaternary phosphonium group.

4,683,190

PROCESS TO LOWER THE VISCOSITY OF COATING SOLUTIONS FOR THE PRODUCTION OF LIGHT-SENSITIVE REPRODUCTION MATERIALS

Manfred A. J. Sondergeld, Muhlheim/Main; Dietmar Dudek, Oberursel, and Klaus Hossner, Rodgau, all of Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 18, 1985, Ser. No. 810,364

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1984, 3514768

Int. Cl.[4] G03C 1/76

U.S. Cl. 430—281 **12 Claims**

1. A process to lower the viscosity of coating solutions for the production of light-sensitive reproduction materials comprising

(A) dissolving in a mixture of solvents a mixture comprising the constituents:

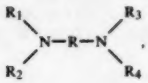
(1) at least one polymeric binder containing salt-forming groups in an amount of 20 to 90% by weight based on

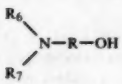
the total constituents of the coating less any solvents present, and

(2) at least one light-sensitive compound that, when exposed to actinic radiation in the form of a layer, changes the solubility, tackiness, or adhesion of the light-sensitive layer taken from the group consisting of light-curing systems of the addition polymerizable and photocrosslinkable types and photosoluble systems, and (B) adding to the solvent mixture

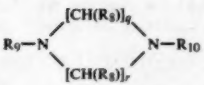
(3) at least one thixotropy-causing filler which is a silicic acid having silanol groups present at least partially in free form and an SiO_2 content greater than 70% by weight in an amont of up to 15% by weight of thixotropy-causing filler relative to the solids content of a dried layer, and

(4) at least one amine-containing compound to lower the viscosity of the coating solution, said amine-containing compound being of the following formulas


(a)


(b)

or


(c)

wherein

R is a linear saturated or unsaturated hydrocarbon chain having 2 to 12 carbon atoms in which one or more carbon atoms can be replaced by $N(R_5)$ O, S, and/or an aromatic radical, or a 5 to 8 membered aliphatic ring;

R_1 to R_4 are H, alkyl, aryl, and aralkyl, whereby R_1 to R_4 can be the same or different;

R_5 is R_1 to R_4;

R_6 and R_7 are R_1 to R_4, $-(CHR_8)_p-OH$;

p is 1 to 6;

q and r are 1 to 6 and can be the same or different;

R_8 is H, alkyl;

R_9 and R_{10} are H, alkyl, $-(CHR_8)_p-OH$, the at least one amine-containing compound being present in an amount of 0.01 to 5% by weight relative to the solids content of a dried layer and being added to the coating solution before or after adding the thixotropy-causing filler.

4,683,191

IMAGEABLE TONER POWDER

Thomas C. Geisler, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 689,706, Jan. 8, 1985, Pat. No. 4,608,329. This application Jun. 9, 1986, Ser. No. 871,992

Int. Cl.[4] G03C *5/24*

U.S. Cl. 430—291 **7 Claims**

1. A method of forming a thermally imageable colored image on a substrate comprising the steps of

(a) forming a latent liquid image on a substrate; and

(b) contacting said liquid image with a thermally imageable toner powder of particles comprising at least 50 weight percent of a supercoolable material, at least 0.01 weight percent of a colorant, up to 20 weight percent of a binder and up to 40 weight percent of an anti-fouling agent.

4,683,192

SILVER HALIDE PHOTOGRAPHIC EMULSIONS AND PROCESS FOR PRODUCING THEM

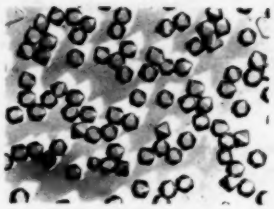
Shingo Nishiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1985, Ser. No. 725,285

Claims priority, application Japan, Apr. 19, 1984, 59-79160

Int. Cl.[4] G03C *1/02, 1/06*

U.S. Cl. 430—567 **7 Claims**



1. A silver halide photographic emulsion containing silver halide grains the surface of which is a (110) crystal plane substantially composed of silver iodobromide.

4,683,193

PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC EMULSION

Mikio Ihama; Tadaaki Tani, and Hiroshi Ohnishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1985, Ser. No. 714,316

Claims priority, application Japan, Mar. 21, 1984, 59-53867

Int. Cl.[4] G03C *1/02, 1/19*

U.S. Cl. 430—570 **10 Claims**

1. A process for producing a spectrally sensitized silver halide photographic emulsion comprising adding a substantially water-insoluble organic spectral sensitizing dye in an aqueous medium to an emulsion before completion of the formation of silver halide grains without using an organic solvent, wherein said substantially water-insoluble organic spectral sensitizing dye has a water solubility of 0.01% by weight or less.

4,683,194

METHOD FOR DETECTION OF POLYMORPHIC RESTRICTION SITES AND NUCLEIC ACID SEQUENCES

Randall K. Saiki, Richmond, and Henry A. Erlich, Oakland, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 614,957, May 29, 1984, abandoned. This application Mar. 28, 1985, Ser. No. 716,982

Int. Cl.[4] C12Q *1/68;* **C12N** *15/00;* **C12P** *19/34*

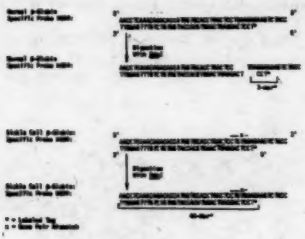
U.S. Cl. 435—6 **28 Claims**

1. A method for detecting the presence or absence of at least one specific restriction site in a specific nucleic acid sequence comprising the steps of:

(a) hybridizing said nucleic acid sequence in solution with an oligonucleotide probe for each restriction site being detected which probe is complementary to a region in said nucleic acid sequence spanning the respective restriction site of the probe and which probe is labeled at the end which is nearer to said respective restriction site than the other end of the probe;

(b) digesting said hybridized nucleic acid sequence with a restriction endonuclease for each restriction site being detected by each probe which is capable of cleaving its respective probe at said restriction site being detected so as to produce labeled and unlabeled oligomer fragments;

(c) separating any labeled cleaved oligomer fragments from labeled uncleaved oligomers; and



(d) detecting the presence or absence of labeled oligomer fragments.

4,683,195

PROCESS FOR AMPLIFYING, DETECTING, AND/OR-CLONING NUCLEIC ACID SEQUENCES

Kary B. Mullis, Kensington; Henry A. Erlich, Oakland; Norman Arnheim, Woodland Hills; Glenn T. Horn, Emeryville; Randall K. Saiki, Richmond, and Stephen J. Scharf, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 824,044, Jan. 30, 1986, abandoned, which is a division of Ser. No. 791,308, Oct. 25, 1985, which is a continuation-in-part of Ser. No. 716,975, Mar. 28, 1985, abandoned. This application Feb. 7, 1986, Ser. No. 828,144

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] **C12Q** *1/68;* **C12P** *19/34;* **C12N** *1/00, 15/00;* **G01N** *33/48, 33/00, 33/566, 33/564;* **C07H** *21/02, 21/04*

U.S. Cl. 435—6 **26 Claims**

1. A process for detecting the presence or absence of at least one specific nuclei acid sequence in a sample containing a nucleic acid or mixture of nucleic acids, or distinguishing between two different sequences in said sample, wherein the sample is suspected of containing said sequence or sequences, which process comprises:

(a) treating the sample with one oligonucleotide primer for each strand of each different specific sequence, under hybridizing conditions such that for each strand of each different sequence to which an oligonucleotide primer is hybridized an extension product of each primer is synthesized which is complementary to each nucleic acid strand, wherein said primer or primers are selected so as to be sufficiently complementary to each strand of each specific sequence to hybridize therewith such that the extension product synthesized from one primer, when it is separated from its complement, can serve as a template for synthesis of the extension product of the other primer;

(b) treating the sample under denaturing conditions to separate the primer extension products from their templates if the sequence or sequences to be detected are present;

(c) treating the sample with olignonucleotide primers such that a primer extension product is synthesized using each of the single strands produced in step (b) as a template, resulting in amplification of the specific nucleic acid sequence or sequences if present;

(d) adding to the product of step (c) a labeled oligonucleotide probe for each sequence being detected capable of hybridizing to said sequence or a mutation thereof; and

(e) determining whether said hybridization has occurred.

4,683,196

METHOD AND MATERIALS FOR THE IDENTIFICATION OF LIPOPOLYSACCHARIDE PRODUCING MICROORGANISMS

Charles A. McLaughlin, Berkeley, Calif., assignor to Meru, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 560,123, Dec. 12, 1983, abandoned. This application Mar. 16, 1984, Ser. No. 590,211

Claims priority, application Canada, Dec. 12, 1983, 443090

Int. Cl.[4] **G01N** *33/569;* **C12N** *15/00, 5/00;* **A61K** *39/40*

U.S. Cl. 435—7 **38 Claims**

1. An immunological reagent for the detection of two more endotoxin lipopolysaccharide/glycolipid antigen producing microorganisms comprising a monoclonal antibody specifically reactive with shared antigenic determinatnts of said lipopolysaccharide/glycolipid antigen said determinants being selected from the group consisting of the Lipid A region and core oligosaccharide region of said lipopolysaccharide/-glycolipid antigen and said antibody being produced by a hybridoma selected from the group consisting of clones Re-1 (ATCC No. HB 8482), Re-2 (ATCC No. HB 8481), LA-4, (ATCC No. HB 8480), LA-5 (ATCC No. HB 8479) and C-2 (ATCC No. HB 8478).

4,683,197

DETECTION METHOD FOR OCCULT BLOOD

Harald Gallati, Dornach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 397,276, Jul. 12, 1982, abandoned. This application May 6, 1985, Ser. No. 730,605

Claims priority, application Switzerland, Jul. 16, 1981, 4673/81

Int. Cl.[4] **G01N** *33/53, 33/72, 33/546*

U.S. Cl. 435—7 **10 Claims**

1. A method for detection of occult human blood in a human stool sample comprising the steps of:

(a) subjecting said sample to a peroxidase test whereby the peroxidative activity of hemoglobin in the presence of alcoholic hydrogen peroxide oxidizes a redox indicator, and

(b) subsequently immunologically detecting in the same sample an immunologically detectable component of human origin selected from the group consisting of albumin and globulin.

4,683,198

NOVEL MALTOSE DEHYDROGENASE, PROCESS FOR ITS PRODUCTION, AND ANALYTICAL METHOD USING THE SAME

Hidehiko Ishikawa; Kazuo Matsuura, and Hideo Misaki, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

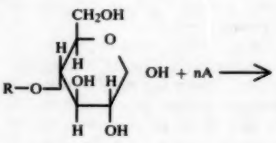
Filed Nov. 23, 1984, Ser. No. 674,009

Claims priority, application Japan, Nov. 22, 1983, 58-219792

Int. Cl.[4] **C12Q** *1/40;* **C12N** *9/04*

U.S. Cl. 435—22 **22 Claims**

1. An enzyme which acts on a reducing terminal of a monosaccharide or oligosaccharide without requiring NAD or NADP and which catalyzes the reaction



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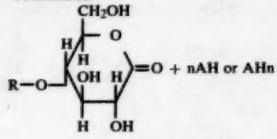


wherein R is a saccharide chain residue or hydrogen, A is a hydrogen acceptor other than NAD or NADP, AH or AHn is a reduced form acceptor and n is 1 or 2, said enzyme having greater substrate specificity on maltose than glucose.

4,683,199

INTERLEUKIN-2 DEPENDENT CYTOTOXIC T-CELL CLONES

Michael Palladino, New York, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,268

Int. Cl.[4] C12P *21/00;* C12N *15/00, 5/00;* C12R *1/91*

U.S. Cl. 435—68 9 Claims

1. A method of stimulating production of the lymphokines α-interferon and β-interferon by interleukin-2 dependent cytotoxic cultured T-cell lines comprising administering to a T-cell line selected from the group consisting of T-cell lines CTLL-RP (CRL 8201), CTLL-R8 (CRL 8202), CTLL-R9 (CRL 8203), CTLL-R11 (CRL 8204), and CTLL-R12 (CRL 8205), an amount of an antigen selected from the group consisting of Newcastle Disease Virus and Sendai Virus sufficient to cause stimulation of production of said lymphokines.

4,683,200

MONOCLONAL ANTIBODY TO HUMAN CANCER ANTIGEN AND METHOD FOR PRODUCING SAME

Setsuo Hirohashi, 5-6 Goban-cho, Chiyoda-ku, Tokyo; Yukio Shimosato, 4-26-1 Minami-Ogikubo, Suginami-ku, Tokyo, and Masahiko Watanabe, 2-7-4 Minami-Tokiwadai, Itabashi-ku, Tokyo, all of Japan, assignors to Setsuo Hirohashi; Yukio Shimosato; Masahiko Watanabe and Nippon Kayaku Kabushiki Kaisha, all of Tokyo, Japan

Filed May 9, 1985, Ser. No. 732,406

Claims priority, application Japan, May 17, 1984, 59-97549; May 22, 1984, 59-101769

Int. Cl.[4] C12P *21/00;* C12N *5/00, 15/00;* A61K *39/00*

U.S. Cl. 435—68 3 Claims

1. A method for production of a monoclonal antibody which binds to human cancer cells or human cancer tissue comprising the steps of:

administering or implanting human cancer cells or human cancer tissue to a murine having no thymus,

propagating the cells or tissue in the murine having no thymus,

administering murine T cells or both murine T cells and murine B cells to the murine having no thymus,

taking antibody-producing B cells from the murine having no thymus,

fusing said antibody-producing B cells with murine myeloma cells to form hybridoma cells,

selecting hybridoma cells producing an antibody which binds to the human cancer cells or human cancer tissue,

cloning the hybridoma cells, culturing the cloned hybridoma cells, and recovering said antibody.

4,683,201

ANTIBIOTIC A80190-PRODUCING ACTINOMADURA OLIGOSPORA AND PROCESS

Robert L. Hamill, Greenwood, and Raymond C. Yao, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 658,976, Oct. 9, 1984, Pat. No. 4,582,822. This application Oct. 15, 1985, Ser. No. 787,564

Int. Cl.[4] C12N *1/20;* C12P *19/60;* C12R *1/03*

U.S. Cl. 435—75 5 Claims

1. A process for producing antibiotic A80190 which comprises cultivating *Actinomadura oligospora* NRRL 15877, or an A80190-producing mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A80190 is produced.

4,683,202

PROCESS FOR AMPLIFYING NUCLEIC ACID SEQUENCES

Kary B. Mullis, Kensington, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 716,975, Mar. 28, 1985, abandoned. This application Oct. 25, 1985, Ser. No. 791,308

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] C12P *19/34;* C12N *15/00, 1/00;* C07H *21/04, 21/02*

U.S. Cl. 435—91 21 Claims

1. A process for amplifying at least one specific nucleic acid sequence contained in a nucleic acid or a mixture of nucleic acids wherein each nucleic acid consists of two separate complementary strands, of equal or unequal length, which process comprises:

(a) treating the strands with two oligonucleotide primers, for each different specific sequence being amplified, under conditions such that for each different sequence being amplified an extension product of each primer is synthesized which is complementary to each nucleic acid strand, wherein said primers are selected so as to be sufficiently complementary to different strands of each specific sequence to hybridize therewith such that the extension product synthesized from one primer, when it is separated from its complement, can serve as a template for synthesis of the extension product of the other primer;

(b) separating the primer extension products from the templates on which they were synthesized to produce single-stranded molecules; and

(c) treating the single-stranded molecules generated from step (b) with the primers of step (a) under conditions that a primer extension product is synthesized using each of the single strands produced in step (b) as a template.

4,683,203

IMMOBILIZED ENZYMES, PROCESSES FOR PREPARING SAME, AND USE THEREOF

Octavian Anton, Brussels; Robert Crichton, Louvain-la-Neuve, and Jean-Pierre Lenders, La Hulpe, all of Belgium, assignors to Redco N.V., Kapelle Op Den Bos, Belgium

Filed Mar. 27, 1985, Ser. No. 716,694

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414232; Oct. 6, 1984, 3436809

Int. Cl.[4] C12P *19/24;* C12N *11/14*

U.S. Cl. 435—94 7 Claims

1. An immobilized enzyme covalently bound to an inorganic carrier by an amino group through a bifunctional spacer, said carrier consisting of amorphous, approximately spherical silica particles obtained by the acidic hydrolysis of an approximately spherical synthetic calcium silicate having a particle size of from 20 to 120 μm, said silica particles having an average particle size of from 15 to 80 μm, an apparent particle volume of from 1.3 to 3 cm^3/g, and a specific surface area of from 250 to 800 m^2/g.

4,683,204

PROCESS FOR PRODUCING ANTIBIOTIC A80190

LaVerne D. Boeck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 9, 1984, Ser. No. 658,977
Int. Cl.[4] C12P *13/00*; C12N *1/20*; C12R *1/03*
U.S. Cl. 435—128 5 Claims

1. In the process for producing antibiotic A80190, the improvement which comprises cultivating *Actinomadura oligospora* NRRL 15878, or an A80190-producing mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A80190 is produced.

4,683,205

METHOD FOR TRANSFORMING MICROORGANISMS

Ryoichi Katsumata; Akio Ozaki, both of Machida; Tetsuo Oka, Yokohama, and Akira Furuya, Kawasaki, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 368,034, Apr. 13, 1982, abandoned.
This application Feb. 4, 1985, Ser. No. 698,254
Claims priority, application Japan, Apr. 17, 1981, 56-58187
Int. Cl.[4] C12N *15/00*
U.S. Cl. 435—172.3 8 Claims

1. A method for transforming microorganisms, which comprises:

(1) selecting a microbial strain of one of the group of genera consisting of Corynbacterium and Brevibacterium;

(2) incubating protoplasts of said microbial strain and a donor deoxyribonucleic acid selected from the group consisting of chromosomal DNAs which are stabilized after cellular introduction by recombination and plasmids in the presence of polyethylene glycol or polyvinylalcohol and at least one divalent metal cation whereby to introduce said donor deoxyribonucleic acid into said protoplasts;

(3) regenerating said protoplasts by culturing in a hypertonic nutrient medium; and

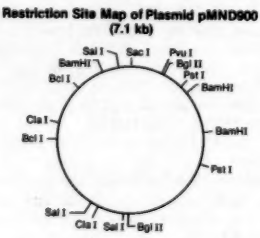
(4) thereafter recovering a transformed strain having a phenotype derived from said donor deoxyribonucleic acid.

4,683,206

RECOMBINANT DNA CLONING VECTORS CONTAINING SELECTABLE GENETIC MARKERS FOR USE IN STREPTOMYCES AND RELATED ORGANISMS

James A. Mabe, and Walter M. Nakatsukasa, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 10, 1984, Ser. No. 639,632
Int. Cl.[4] C12N *1/20, 15/00, 1/00*; C12P *21/00, 19/34*; C12R *1/465, 1/485, 1/54*; C07H *21/04*
U.S. Cl. 435—253 24 Claims



1. A recombinant DNA cloning vector comprising:

(a) a functional origin of replication-containing restriction fragment of plasmid pMND900, and

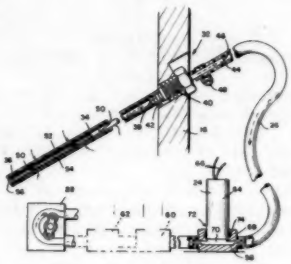
(b) one or more DNA segments that convey resistance to at least one antibiotic or that convey colorimetric sensitivity when transformed into a sensitive restrictionless host cell.

4,683,207

CULTURE MONITORING SYSTEM

Thomas L. Waarvik, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 5, 1984, Ser. No. 678,295
Int. Cl.[4] C12M *1/12*
U.S. Cl. 435—311 11 Claims



1. A system for continuously monitoring the chemistry of a liquid medium within a container comprising an assaying means located exteriorly of the container, a conduit connected to the assaying means and leading to the container, a probe connected to the conduit and penetrating a wall of the container, the probe including a microporous filtering element for separating a filtrate from the culture medium, the filtering element having a surface roughness less than about 50 microinches, and means for delivering the filtrate from the probe through the conduit to the assaying means.

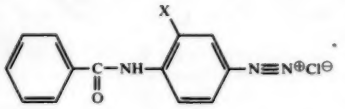
4,683,208

METHOD FOR THE DETERMINATION OF BILIRUBIN

Norihito Aoyama; Akira Miike, both of Shizuoka; Mikio Okano, Nagoya, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,717
Claims priority, application Japan, Mar. 29, 1985, 60-65600
Int. Cl.[4] G01N *33/00, 31/00*
U.S. Cl. 436—12 11 Claims

1. A method for the determination of bilirubin in a sample which comprises reacting the bilirubin with a diazonium compound represented by the formula (I)



(I)

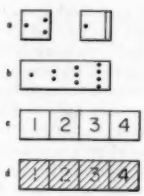
wherein X represents halogen atom and determining the formed pigment.

4,683,209

VIABILITY TEST DEVICE

Ibrahim A. Ismail, Mishawaka; Paul Hemmes; Mark T. Skarstedt, both of Elkhart, and Adam Zipp, Goshen, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 705,711, Feb. 26, 1985, Pat. No. 4,649,121.
This application Jul. 21, 1986, Ser. No. 887,723
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—14 6 Claims



1. A method for preparing a viability test device, comprising the sequential steps of:

(a) incorporating a carrier matrix substantially uniformly with a test composition which test composition is capable of providing a detectable optical response upon wetting of the test composition incorporated carrier matrix with water in the presence of the analyte to be determined;

(b) drying;

(c) incorporating at least a portion of the dried carrier matrix with a solution of unreacted analyte, or analog thereof, in a dried non-aqueous solvent at a analyte concentration sufficient to provide a detectable optical response in the doubly incorporated carrier matrix upon wetting of the matrix with water; and

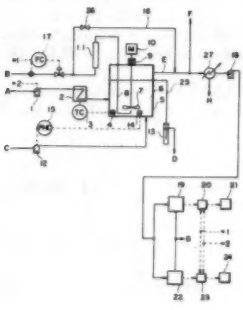
(d) drying.

4,683,210

METHOD FOR MEASURING CONCENTRATIONS OF $CACO_3$ AND $CASO_3$ IN A SLURRY

Masakazu Onizuka; Atsushi Tatani; Takayoshi Hamada, and Setsuo Omoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,552
Claims priority, application Japan, Aug. 10, 1983, 58-144894
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] G01N *1/00, 33/00, 35/00*
U.S. Cl. 436—50 18 Claims



1. A continuous method for measuring the concentration of an inorganic compound selected from the group consisting of $CaCO_3$, $CaSO_3$ and mixtures thereof in a slurry containing such an inorganic compound, consisting essentially of:

continuously sampling a given amount of the slurry;

feeding the sampled slurry at a predetermined flow rate into an agitated continuous reactor container having a bottom and which is isolated from outside air;

maintaining the sample slurry in the reactor container at a temperature not lower than 70° C.;

adding an acid to the reactor container to adjust the pH of the slurry therein to below 3, said acid reacting with said inorganic compound to form a reaction product and to generate a gaseous product selected from the group consisting of CO_2, SO_2 and mixtures thereof, wherein CO_2 is generated when the inorganic compound is $CaCO_3$, SO_2 is generated when the inorganic compound is $CaSO_3$ and a mixture of CO_2 and SO_2 is generated when the inorganic compound is a mixture of $CaCO_3$ and $CaSO_3$;

blowing a carrier gas into the slurry in the reactor container at a predetermined flow rate;

withdrawing the carrier gas with the gaseous product entrained therein from the reactor container;

measuring the concentration of the entrained gaseous product in the withdrawn carrier gas; and

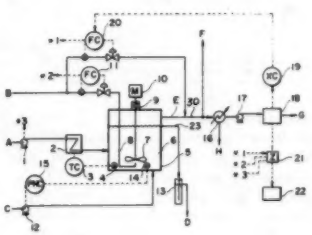
determining the concentration of said inorganic compound in the slurry from the concentration of the entrained gaseous product in the withdrawn carrier gas, the flow rate of the samples slurry and the flow rate of the carrier gas, wherein said continuous method is a high speed continuous method capable of measuring the concentration of said inorganic compound in an absorption solution used for pH control of a high speed load variation characterized desulfurization system.

4,683,211

METHOD FOR MEASURING THE CONCENTRATION OF $CACO_3$ IN A SLURRY

Masakazu Onizuka; Atsushi Tatani, and Takayoshi Hamada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,512
Claims priority, application Japan, Aug. 10, 1983, 58-144895
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] G01N *1/00, 33/00, 35/00*
U.S. Cl. 436—50 8 Claims



1. A continuous method for measuring the concentration of $CaCO_3$ in a slurry containing $CaCO_3$, the steps consisting essentially of:

continuously sampling a given amount of the slurry;

feeding the sampled slurry at a predetermined flow rate into an agitated continuous reactor container which is isolated from outside air;

maintaining the sampled slurry in the reactor container at a temperature of at least 50° C.;

adding an acid to the reactor container to adjust the pH of the slurry therein to below 4, said acid reacting with $CaCO_3$ to form a reaction product and to generate CO_2;

blowing a predetermined flow rate of air into the slurry in the reactor container;

withdrawing gas from the reactor container wherein the withdrawn gas comprises the blown air with generated CO_2 entrained therein;

diluting the withdrawn gas with air while controlling the flow rate of the dilution air so that the CO_2 concentration in said diluted withdrawn gas is maintained constant;

determining the flow rate of the diluted withdrawn gas;

passing the diluted withdrawn gas with generated CO_2 entrained therein into a CO_2 analyzer;

measuring the concentration of entrained CO_2 in the diluted withdrawn gas; and

determining the concentration of $CaCO_3$ in the slurry from the concentration of entrained CO_2 in the diluted withdrawn gas, the flow rate of the diluted withdrawn gas and the flow rate of the sampled slurry, wherein said continuous method is a high speed continuous method capable of measuring the concentration of $CaCO_3$ in an absorption solution used for pH control of a desulfurization system.

4,683,212

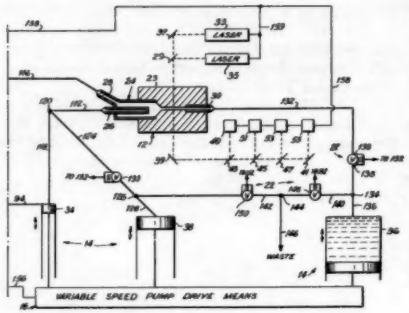
RANDOM ACCESS SINGLE CHANNEL SHEATH STREAM APPARATUS

Kenneth F. Uffenheimer, Mahopac, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,639

Int. Cl.[4] G01N *21/05*

U.S. Cl. 436—52 **16 Claims**



1. A method comprising, the steps of, selecting a sample fluid source from a plurality of separate sources of different sample fluids, selecting a source of a sheath fluid which is optically compatible with the sample fluid from the thusly selected sample fluid source from a plurality of separate sources of different sheath fluids which are respectively optically compatible with different ones of said different sample fluids, connecting the selected one, only, of said plurality of different sample fluid sources to sheath stream flow cell analysis means which includes a single sheath flow cell, concomitantly connecting the selected one, only, of said plurality of different sheath fluid sources to said sheath stream flow cell, both connecting steps performed under the control of control means operatively associated with each of said different sample and sheath stream fluid sources and said sheath stream flow cell, and concomitantly flowing the thusly selected optically compatible sample and sheath fluids through said sheath stream flow cell for sample fluid analysis by concomitantly differentially pumping the same from the respective sources thereof through said sheath stream flow cell.

4,683,213

METHOD FOR PREDICTING THE FERTILITY OF MALE MAMMALS

Roy L. Ax, Mazomanie, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 22, 1985, Ser. No. 725,569

Int. Cl.[4] G01N *33/53*

U.S. Cl. 436—501 **14 Claims**

1. A method for evaluating the fertility of a test male mammal relative to the fertility of a control male mammal comprising the steps of:

(a) collecting samples of semen from the test male and the control male; and

(b) measuring the binding affinity of a selected glycosaminoglycan to the sperm of the semen samples by a selected means for measuring binding affinities, whereupon the fertility of the test male may be evaluated, as higher or lower than that of the control male by the degree to which the binding affinity of the glycosaminoglycan to its sperm is higher or lower than the binding affinity of the glycosaminoglycan to the sperm of the control male.

4,683,214

NOBLE METAL-CONTAINING CATALYSTS

Philip J. Angevine, West Deptford, and Stephen M. Oleck, Moorestown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 647,594, Sep. 6, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 801,499

Int. Cl.[4] B01J *29/32*

U.S. Cl. 502—66 **42 Claims**

1. A process for preparing a noble metal-containing zeolite catalyst which comprises crystallizing a zeolite from a forming mixture which contains an organic template, treating the as-crystallized zeolite to remove greater than about 75% by weight of said template from the zeolite, blending said zeolite with an inorganic oxide binder and a noble metal-containing solution, and extruding the blended mixture.

2. The process of claim **1** wherein said treating comprises chemical oxidation of said organic template.

3. The process of claim **2** wherein said treating comprises contacting said zeolite with sodium hypochlorite.

4. The process of claim **1** wherein said treating comprises calcining said zeolite at temperatures ranging from about 460° to 816° C.

15. The process of claim **1** wherein the noble metal is selected from the group consisting of platinum, palladium, rhodium, ruthenium, silver, rhenium, and iridium.

4,683,215

PROCESS FOR REMOVING CONTAMINANTS FROM A LIQUID $TICL_4$ PHASE

Jean L. Bilhou, The Hague, and Brian L. Goodall, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 8, 1986, Ser. No. 860,941

Claims priority, application United Kingdom, May 22, 1985, 8513000

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—107 **15 Claims**

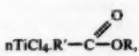
10. A process for preparing a solid catalyst component for 1-alkene polymerization which comprises:

(1) reacting $TiCl_4$ with magnesium alkyoxy or -aryloxychloride in the presence of a halohydrocarbon in a liquid phase,

(2) separating the solid product so obtained from the liquid phase,

(3) reacting the liquid phase which is contaminated with a compound of the formula $TiCl_3OR$ with an organic acid halide of the formula

wherein R' is an aryl or alkyl group, to precipitate an addition complex of the formula



wherein n is a number of from 0.3 to 3.0,

(4) separating the solid addition complex from the liquid phase,

(5) slurrying the solid product of step (1) in the latter liquid phase at a temperature of at least 60° C. during at least 0.5 hours, followed by

(6) separating the solid reaction product form the liquid phase.

4,683,216

PROCESS FOR ACTIVATING A COMPOSITE CATALYST USEFUL FOR HYDROCARBON CONVERSION REACTIONS

Dan Farcasiu, Flemington, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 705,988, Feb. 27, 1985, Pat. No. 4,585,750, which is a continuation-in-part of Ser. No. 563,818, Dec. 21, 1983, abandoned. This application Apr. 4, 1986, Ser. No. 848,259

Int. Cl.[4] B01J *31/06*

U.S. Cl. 502—159 **10 Claims**

1. A method of producing a catalyst composite of a perfluorinated-polymersulfonic acid and and anion-stabilizing agent comprising contacting the perfluorinted-polymersulfonic acid with a mixture of the stabilizing agent and its anhydride the stabilizing agent being a fluorinated carboxylic acid.

4,683,217

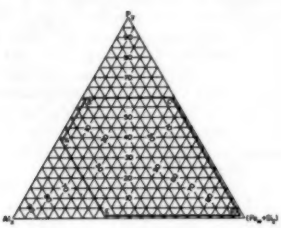
IRON-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVES

Brent M. Lok, New City; Lawrence D. Vail, New Rochelle, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 13, 1984, Ser. No. 600,173

Int. Cl.[4] B01J *27/182*

U.S. Cl. 502—214 **26 Claims**



1. Crystalline molecular sieves having framework structures of FeO_2, AlO_2, PO_2 and SiO_2 tetrahedral units and having a unit empirical formula:

$$mR:(Fe_wAl_xP_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present, in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(Fe_wAl_xP_ySi_z)O_2$ and has a value of zero to about 0.3; and "w", "x", "y" and "z" represent the mole fractions of iron, aluminum, phosphorus and silicon, respectively, present as tetrahedral oxides, each having a value of at least 0.01, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of FIG. 1.

4,683,218

CHLORINE RESISTANT SHIFT GAS CATALYST

Lynn H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1986, Ser. No. 863,271

Int. Cl.[4] B01J *23/02, 23/06, 23/10, 23/72*

U.S. Cl. 502—302 **2 Claims**

1. A water gas shift catalyst composition having a high resistance to chloride poisoning which contains essentially of copper, zinc, a rare earth element and from about 5 to about 30 atomic weight percent of an alkaline earth element (basis total metals present) and which is prepared by a process comprising:

(a) precipitating an aqueous solution of salts of copper, zinc and the rare earth element with an alkali metal or ammonium carbonate or bicarbonate precipitating agent,

(b) collecting the precipitate of step (a),

(c) reslurring the precipitate of step (b) with an aqueous solution of a salt of an alkaline earth element,

(d) precipitating the slurried solution of step (c) with an alkali metal or ammonium carbonate or bicarbonate precipitating agent,

(e) drying and calcining the precipitate of step (d) at a temperature between about 200° C. and 400° C. and

(f) reducing the material of step (e) in a hydrogen-containing gas at a temperature between about 175° and about 400° C.

4,683,219

PROCESS FOR PRODUCTION OF A SYNGAS CONVERSION CATALYST

Leonard Cotton, 1 Windmill Lane, Ewell, Epsom, Surrey; Barry Nay, 15 Park Place, Woking, Surrey, GU22 7NP, and Michael J. Wilcox, Top Flat, 93 Heath Road, Weybridge, Surrey, KT13 8TS, all of England

PCT No. PCT/GB85/00330, § 371 Date Mar. 4, 1986, § 102(e) Date Mar. 4, 1986, PCT Pub. No. WO86/00885, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 25, 1985, Ser. No. 848,401

Claims priority, application United Kingdom, Jul. 25, 1984, 8418975

Int. Cl.[4] B01J *23/10, 23/46, 23/58*

U.S. Cl. 502—304 **14 Claims**

1. A process for the production of a composition for use after reductive activation as a catalyst in the conversion of synthesis gas to hydrocarbons of carbon number greater than one, which composition has the formula:

$$Ru_aA_bCeO_x \quad (I)$$

wherein

A is an alkali metal,

x is a number such that the valence requirements of the other elements for oxygen is satisifed,

a is greater than zero and less than 1% w/w, based on the total weight of the composition,

b is in the range from zero to 10% w/w, based on the total weight of the composition, and

Ce and O constitute the remainder of the composition,

which process comprises the steps of:

(A) bringing together in solution soluble salts of the metals ruthenium and cerium and a precipitant comprising a carbonate and/or a bicarbonate and/or a hydroxide of an alkali metal or ammonium under conditions whereby there is formed a precipitate comprising ruthenium and cerium in the form of compounds thermally decomposable to their oxides, and

(B) recovering the precipitate obtained in step (A).

4,683,220

NOVEL PHYSIOLOGICALLY ACTIVE SUBSTANCES K-26, A PROCESS FOR PREPARATION THEREOF AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Masayuki Yamato, Machida; Hiroshi Kase, Koganei; Isao Kawamoto, Hiratsuka, all of Japan; Masaji Kasai, Rockville, Md.; Kunikatsu Shirahata, Komae, Japan; Takashi Deguchi, Mishima, Japan; Katsuichi Shuto, Shizuoka, Japan; Akira Karasawa, Shizuoka, Japan; Ryo Okachi, Shizuoka, Japan, and Kiyoshi Nakayama, Sagamihara, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

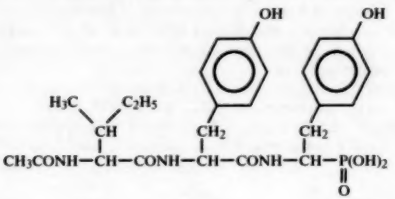
Continuation of Ser. No. 744,309, Jun. 13, 1985, abandoned, which is a continuation of Ser. No. 661,886, Oct. 18, 1984, abandoned, which is a continuation of Ser. No. 359,030, Mar. 17, 1982, abandoned. This application Sep. 26, 1986, Ser. No. 912,685

Claims priority, application Japan, Mar. 20, 1981, 56-40651

Int. Cl.[4] A61K *37/64*

U.S. Cl. 514—7 **3 Claims**

1. The compound, K-26, represented by the formula:



wherein the configuration of the isoleucine and tyrosine parts is L-form and the 1-amino-2-(4-hydroxyphenyl)ethylphosphonic acid part has negative specific rotation.

4,683,221

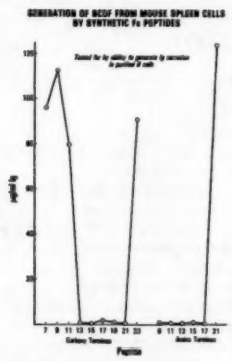
LYMPHOCYTE-ACTIVATING POLYPEPTIDES

William O. Weigle, Del Mar; Monte O. Hobbs, Carlsbad; Edward L. Morgan; Marilyn L. Thoman, both of San Diego, and Richard A. Houghten, Solana Beach, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Jan. 9, 1986, Ser. No. 817,526

Int. Cl.[4] A61K *37/02;* **C07K** *5/10, 7/06*

U.S. Cl. 514—14 **15 Claims**



1. A polypeptide containing 4 to about 11 residues, and having an amino acid residue sequence, written from left to right and in the direction from amino-terminus to carboxy-terminus, that corresponds to the formula:

$$(B)_b\text{-Leu-Pro-Pro-Ser-}(Y)_y$$

and the pharmaceutically acceptable non-toxic salts thereof,

wherein B is the amino acid residue Thr or is a polypeptide, written from left or right and in the direction from amino-terminus to carboxy-terminus, selected from the group consisting of Tyr-Thr, Val-Tyr-Thr and Gln-Val-Tyr-Thr;

Y is the amino acid residue Arg, or is a peptide, written from left to right and in the direction from amino-terminus to carboxy-terminus, selected from the group consisting of Arg-Glu and Arg-Glu-Glu; and

b and y are each independently one or zero, such that when either or both of b and y are zero, the respective B and Y are absent, and when either or both of b and y are one, the respective B and Y are present.

4,683,222

N-GLYCOSYLATED CARBOXAMIDE DERIVATIVES AND THEIR USE FOR INFLUENCING THE BODY'S INHERENT DEFENCES

Peter Stadler, Elkhart, Ind.; Oswald Lockhoff, Leverkusen, Fed. Rep. of Germany; Hans-Georg Opitz, Wuppertal, Fed. Rep. of Germany, and Klaus Schaller, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

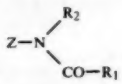
Continuation of Ser. No. 481,210, Apr. 1, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 725,060

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213650

Int. Cl.[4] A61K *31/70;* **C07H** *15/12*

U.S. Cl. 514—42 **18 Claims**

1. A compound of the formula I



(I)

wherein Z denotes a glycosyl radical selected from the group consisting of rhamnopyranosyl, 6-deoxy-6-fluoro-D-glucopyranosyl, glucuronopyranosyl, 4-amino-4-deoxy-D-glucopyranosyl, 4-lauroylamido-4-deoxy-D-glucopyranosyl, 2-olanylamido-2-deoxy-D-glucopyranosyl, 2-stearoylamido-2-deoxy-D-glucopyranosyl glucopyranosyl, galactopyranosyl, mannopyranosyl, glucofuranosyl, ribofuranosyl, arabinopyranosyl or lyxopyranosyl, D-glycero-D-glucoheptopyranosyl, maltosyl, maltrotriosyl, maltotetraosyl, lactosyl, cellobiosyl, melibiosyl, 6-O-(α- or β-ribofuranosyl)-glucopyranosyl, 2-amino-2-deoxyglucopyranosyl, 4-azido-4-deoxyglucopyranosyl, 4-stearoylamido-4-deoxy-D-glucopyranosyl, 4-dodecoylamido-4-deoxy-D-glucopyranosyl, 6-hexadecanoylamido-6-deoxy-D-galactopyranosyl, 2,6-diamino-2,6-dideoxyglucopyranosyl, 6,6'-diamino-6,6'-dideoxymaltosyl, 6-amino-6,6'dideoxylactosyl, 6-deoxymannopyranosyl, 2-deoxyribofuranosyl, fucosyl, 5-fluoro-5-deoxyribofuranosyl, 6-O-methylglucopyranosyl, 6-deoxy-6-thioglucopyranosyl, 3-deoxy-3-nitrogalactopyranosyl, galacturonic acid, methyl glucuronate, glucuronamide and N-dodecylglucuronamide bonded via the anomeric carbon atom, R_1 denotes an optionally substituted straight or branched C_9–C_{21}-alkyl or C_7–C_{21}-alkenyl radical, and R_2 denotes a straight-chain or branched or C_9–C_{21}-alkyl or C_7–C_{21}-alkenyl radical, or an aralkyl radical having up to 30 C atoms in which the aryl portion is mono- or bi-cyclic carbocyclic aryl and the alkyl portion contains 1 to 4 carbon atoms, which can be substituted by halogen.

18. A method for stimulating the body's immune system defense in a warm-blooded animal which comprises adminis-

tering to said warm-blooded animal an immune system antibody increasing amount of a compound of claim 1 either alone or in admixture with an inert carrier or in the form of a medicament.

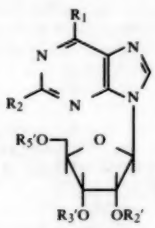
4,683,223

N_6-BENZOPYRANO-AND BENZOTHIOPYRANO ADENOSINES AND METHODS OF USE

Bharat K. Trivedi, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

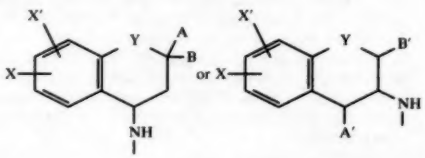
Filed Sep. 9, 1985, Ser. No. 772,984
Int. Cl.[4] A61K *31/70;* **C07H** *19/67*
U.S. Cl. 514—46 **21 Claims**

1. A compound of the formula



I

wherein R_1 is of formula



wherein Y is O, S, SO, or SO_2; X and X′ are each independently hydrogen, lower alkyl, lower alkoxy, hydroxy, lower alkanoyl, nitro, amino, trifluoromethyl, halogen, or when taken together —O—CH_2—O—; A and B are each independently hydrogen or lower alkyl; A′ and B′ are each independently hydrogen, lower alkyl or hydroxyl; R_2 is (a) hydrogen, (b) halogen, (c) NR^iR^{ii} where R^i and R^{ii} are independently hydrogen, lower alkyl, phenyl or phenyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, (d) SR where R is hydrogen, lower alkyl, or phenyl; R_2', R_3', and R_5' are independently hydrogen, lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl, or R_2' and R_3' together may be lower alkylidene; and wherein the compounds contain asymmetric carbon atoms its diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof.

18. A method for treating sleep disorders in a subject suffering therefrom comprising administering to such subject a compound as claimed in claim **1** in unit dosage form.

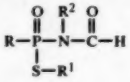
4,683,224

N-FORMYL PHOSPHONAMIDOTHIOATES AS PESTICIDES

Mohamed A. H. Fahmy, Modesto, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 777,379, Sep. 18, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 885,161
Int. Cl.[4] A01N *57/02;* **C07F** *9/44*
U.S. Cl. 514—120 **10 Claims**

1. A compound of the formula



wherein R is alkyl or alkenyl of up to six carbon atoms, phenyl or benzyl, R^1 is straight-chain alkyl of three to five carbon atoms, branched-chain alkyl of three to six carbon atoms, phenyl or benzyl, and R^2 is hydrogen, alkyl, alkenyl or alkynyl of up to six carbon atoms, or alkyl of one to six carbon atoms substituted by phenyl; phenyl or phenyl substituted by one to three substituents selected from alkyl of one to six carbon atoms and halogen.

2. A method for killing insects and mites that comprises subjecting the insect to a lethal dosage of a compound of claim **1**.

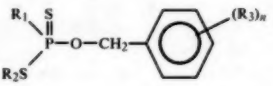
4,683,225

O-(SUBSTITUTED) BENZYL DITHIOPHOSPHONATE INSECTICIDES

Charles G. Chavdarian, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

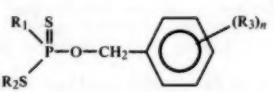
Filed Oct. 28, 1985, Ser. No. 792,087
Int. Cl.[4] A01N *57/06;* **C07F** *9/40*
U.S. Cl. 514—128 **52 Claims**

1. A method for controlling insects comprising applying to an insect, the locus of an insect or a locus at which insecticidal control is desired, an insecticidally effective amount of a compound having the formula



in which R_1 is methyl or ethyl; R_2 is C_1–C_6 alkyl; R_3 is halogen, C_1–C_4 alkyl, trifluoromethyl, thio-(C_1–C_4 alkyl) or phenoxy, and n is 0, 1 or 2; provided that if R_2 is methyl, then R_1 is methyl.

28. A compound having the formula



in which R_1 is methyl or ethyl; R_2 is C_1–C_6 alkyl; R_3 is halogen, C_1–C_4 alkyl, trifluoromethyl, thio-(C_1–C_4 alkyl) or phenoxy, and n is 0, 1 or 2; provided that if R_2 is methyl, then R_1 is methyl.

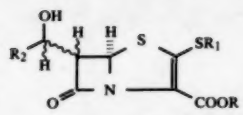
4,683,226

6-HYDROXYALKYL-2-(SUBSTITUTED-THIO)PENEM-3-CARBOXYLIC ACIDS

Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 62,875, Aug. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,471, Jan. 10, 1979, abandoned, and a continuation-in-part of Ser. No. 91,610, Nov. 5, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,318
Int. Cl.[4] C07D *499/00;* **A61K** *31/425*
U.S. Cl. 514—192 **9 Claims**

1. A compound represented by the formula



or a pharmaceutically acceptable salt thereof, wherein:

R is hydrogen, an alkali metal cation or a metabolisable ester group;

R_1 is amino(lower)alkyl or chloro(lower)alkylcarbonylamino(lower) alkyl;

and R_2 is hydrogen or lower alkyl of from 2 to 6 carbon atoms.

4,683,227

ANTIBIOTIC DERIVATIVES OF 7β-[2-(THIAZOL-4-YL)ACETAMIDE]-3-CHLORO-3-CEPHEM-4-CARBOXYLIC ACIDS AND COMPOSITIONS AND METHOD OF USE THEREOF

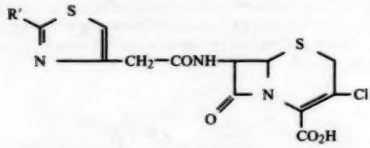
Stjepan Kukolja, Carmel, and Walter E. Wright, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 9, 1985, Ser. No. 753,291

Int. Cl.[4] A61K *31/545;* **C07D** *501/20*

U.S. Cl. 514—202 **9 Claims**

1. The compound of the formula



wherein R′ is chloro or methyl, and the pharmaceutically acceptable non-toxic salts thereof.

4,683,228

GUANIDINOPYRAZOLYLAMIDES, GUANIDIMOIMIDAZOLYLAMIDES, COMPOSITIONS CONTAINING THEM, AND METHOD OF USING THEM TO INHIBIT GASTRIC ACID SECRETION

Karin M. Kirkland, Wilmington, Del., and Derrick M. Mant, Stockport, England, assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries PLC, London, England

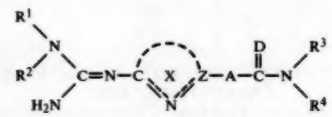
Filed Jan. 22, 1985, Ser. No. 693,179

Claims priority, application United Kingdom, Jan. 24, 1984, 8401751

Int. Cl.[4] A61K *31/54, 31/55;* **C07D** *419/12, 419/14*

U.S. Cl. 514—211 **14 Claims**

1. A guanidine derivative of the formula I:



I

in which

R^1 and R^2, which may be the same of different, are hydrogen atoms or branched or unbranched 1–10C alkyl, 3–8C cycloalkyl or 4–14C cycloalkylalkyl radicals, each alkyl, cycloalkyl or cycloalkylalkyl radical being optionally substituted by one or more halogen atoms selected from fluorine, chlorine and bromine atoms, provided that at least one of R^1 and R^2 is a halogen-substituted alkyl, cycloalkyl or cycloalkylalkyl radical and provided there is no halogen substituent on the carbon atom of the alkyl, cycloalkyl or cycloalkylalkyl radical which is directly attached to the nitrogen atom, or R^2 is a hydrogen atom and $-R^1$ is a radical of the formula II:

$$R^5—E—W— \qquad \text{II}$$

in which W is an unbranched 2–6C alkylene chain which is optionally substituted by one or two 1–4C alkyl radicals, E is an oxygen or suphur atom, a sulphinyl or sulphonyl radical, or a radical of the formula NR^6 in which R^6 is a hydrogen atom or a 1–6C alkyl radical, R^5 is a hydrogen atom or an unbranched 1–6C alkyl radical which is optionally substituted by one or two 1–4C alkyl radicals, or R^5 and R^6 are joined to form, together with the nitrogen atom to which they are attached, a pyrrolidine, piperidine, morpholine, piperazine or N-methylpiperazine ring;

in ring X the dotted line is a double bond on one side of the nitrogen atom and Z is a carbon or nitrogen atom such that ring X is pyrazole or imidazole wherein said ring X may, where possible, carry one or two optional substituents, the optional substituents, on ring X being selected from fluorine, chlorine and bromine atoms and 1–6C alkyl, 1–6C alkoxy, trifluoromethyl, hydroxy and amino radicals;

—A— is a 3–8C alkylene chain which is substituted by a hydroxy radical and into which is optionally inserted, as part of the backbone of the chain, one or two groups selected from oxygen and sulphur atoms and NH and 1–6C N-alkyl radicals, provided that the shortest link between ring X and C=D is of at least 3 atoms, provided that no optional insertion is made in chain A which results in the inserted group being directly attached to C=D provided that no two insertions are directly attached one to the other, and provided that an inserted atom or radical is not attached to the carbon atom which carries the hydroxy radical;

D is an oxygen or sulphur atom;

R^3 is a hydrogen atom or a hydroxy, amino, 1–6C alkylamino, 1–6C haloalkylamino, 1–6C alkanoylamino, 1–6C alkyl, 3–8C cycloalkyl, 4–12C cycloalkylakyl, 2–6C alkenyl, 2–6C alkynyl, 1–6C haloalkyl, 1–6C alkoxy, 1–6C hydroxyalkyl, 2–10C alkoxyalkyl, 2–10C alkylthioalkyl, 1–6C aminoalkyl, 2–8C alkylaminoalkyl, 3–12C dialkylaminoalkyl, 2–8C alkanoylaminoalkyl, 8–14C benzoylaminoalkyl, 3–10C alkoxycarbonylalkyl, 2–8C carbamoylalkyl, phenyl, 7–11C phenylalkyl, heteroaryl or heteroarylalkyl radicals, wherein the heteroaryl part is a furan, thiophene, pyrrole, thiazole, oxazole, imidazole, thiadiazole, oxadiazole, triazole, pyrazole, pyridine or pyrimidine ring, wherein the alkyl part of the heteroarylalkyl radical is 1–6C and wherein, when R^3 is a phenyl or heteroaryl ring, that ring is optionally substituted by one or two groups selected from fluorine, chlorine, bromine and iodine atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, 2–6C dialkylamino, 2–6C alkanoyl, trifluoromethyl, hydroxy and amino radicals;

R^4 is a hydrogen atom; or R^3 and R^4 are joined to form, together with the nitrogen atom to which they are attached, a 5-6- or 7-membered saturated ring which optionally contains a double bond or an additional oxygen atom, NH or 1–6C N-alkyl radical;

and a pharmaceutically-acceptable acid-addition salt thereof.

13. A pharmaceutical composition useful to inhibit gastric acid secretion comprising an effective amount of a guanidine derivative as claimed in claim **1** in association with a pharmaceutically-acceptable diluent or carrier.

14. A method of inhibiting gastric acid secretion in a warm-blooded animal comprising administering to the warm-blooded animal the pharmaceutical composition as defined in claim **13**.

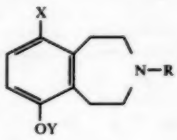
4,683,229

6-HALO-9-ALKENYLENEOXY-3-ALKYL-2,3,4,5-TETRAHYDRO-(1H-3)-BENZAZEPINES AND THEIR USE AS SELECTIVE ALPHA-ADRENERGIC RECEPTOR ANTAGONISTS

Robert M. Demarinis, Ardmore, Pa., and Francis R. Pfeiffer, Cinnaminson, N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Mar. 17, 1986, Ser. No. 840,621
Int. Cl.[4] C07D *223/16;* A61K *31/55*
U.S. Cl. 514—213 11 Claims

1. A compound represented by the Formula:



in which:

R is C_{1-5} alkyl;

X is Br, Cl, F;

Y is $-CH_2-CH=C(CH_3)_2$, $-CH=CH-CH_3$, $-CH=C(CH_3)_2$, $-CH=CH-CH_2-CH_3$, or $-CH=CH-CH(CH_3)_2$;

or any pharmaceutically acceptable salt or hydrate thereof.

9. A method of producing selective alpha$_3$-adrenoceptor antagonism in mammals that comprises administering internally to a subject in need of such antagonism an effective amount of a compound of claim 1.

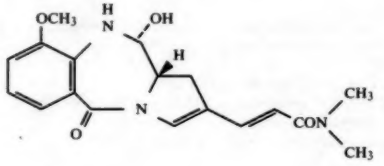
4,683,230

BMY-28121, A NEW ANTITUMOR ANTIBIOTIC

Mitsuaki Tsunakawa, Tokyo; Masataka Konishi, Kawasaki, and Takeo Miyaki, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 704,973
Int. Cl.[4] A61K *31/55;* C07D *487/04*
U.S. Cl. 314—214 10 Claims

1. The antibiotic BMY-28121A of the formula



3. A method for therapeutically treating an animal host affected by a bacterial infection, which comprises administering to said host an effective antibacterial dose of BMY-28121A.

4,683,231

METHOD OF PREVENTING WITHDRAWAL SYMPTOMS ASSOCIATED WITH THE CESSATION OR REDUCTION OF TOBACCO SMOKING

Alexander H. Glassman, Teaneck, N.J., assignor to Research Foundation for Mental Hygiene, Inc., New York, N.Y.

Division of Ser. No. 585,900, Mar. 2, 1984, Pat. No. 4,588,739.
This application Apr. 16, 1986, Ser. No. 852,650
Int. Cl.[4] A61K *31/395*
U.S. Cl. 514—220 7 Claims

1. A method of preventing in a human subject accustomed to smoking tobacco the withdrawal symptoms associated with the cessation or reduction of tobacco smoking comprising administering to the subject an effective symptom preventing amount of alprazolam.

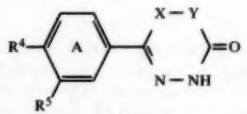
4,683,232

HETEROCYCLIC COMPOUNDS HAVING CARDIOTONIC USE

David Brown, Macclesfield; Robert I. Dowell, Congleton; Rodney B. Hargreaves, Poynton, and Brian G. Main, Sandbach, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 675,741, Nov. 28, 1984, Pat. No. 4,587,246, which is a division of Ser. No. 528,103, Aug. 31, 1983, Pat. No. 4,503,054, which is a division of Ser. No. 321,899, Nov. 16, 1981, Pat. No. 4,423,045. This application May 1, 1986, Ser. No. 858,126
Claims priority, application United Kingdom, Nov. 14, 1980, 8036680
Int. Cl.[4] A61K *31/535;* C07D *273/04*
U.S. Cl. 514—228 5 Claims

1. A heterocyclic compound of the formula:



wherein X is $-CR^1R^2-$ and Y is oxygen, wherein R^1, and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms;

wherein R^4 and R^5, which may be the same or different, each is hydrogen, cyano, nitro, amino or hydroxy, or alkylthio of up to 4 carbon atoms, or has the formula:

$-Q-CZ-OR^6$	$-Q-SO_2-NR^7R^8$
$-Q-CZ-NR^7R^8$	$-Q-SO_2-R^9$
$-Q-CZ-R^9$	$-Q-SO-R^9$

wherein Q is a direct link, or is imino (—NH—), or is oxyalkylene of up to 4 carbon atoms, wherein Z is oxygen or sulphur and wherein R^6, R^7, R^8 and R^9, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein R^7 and R^8 together with the adjacent nitrogen atom form a 5- or 6-membered fully-saturated heterocyclic ring, provided that R^4 and R^5 are not both hydrogen;

or wherein R^4 and R^5 are joined together such that with the benzene ring A they form a benzheterocyclic ring wherein the heterocyclic part is a 5- or 6-membered ring containing one oxygen, sulphur or nitrogen atom, and which heterocyclic part may optionally contain an oxo substituent or an alkyl or alkanoyl substituent each of up to 6 carbon atoms;

and wherein the benzene ring A bears no further substituent or bears one or more chloro, bromo, methyl, ethyl, methoxy or ethoxy substituents;

or a salt thereof where appropriate.

5. A method for the treatment of acute or chronic heart failure in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of a heterocyclic compound claimed in claim 1.

4,683,233

SALTS OF 2-KETO-2H, 3H-1,2-BENZISOTHIAZOLE 1,1-DIOXIDE AS MICROBICIDES

Herbert Salzburg; Manfred Hajek, both of Cologne; Gerd Hänssler, Leverkusen, and Varl-Heinz Kuck, Langenfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

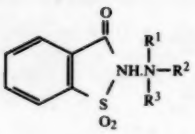
Filed Feb. 22, 1985, Ser. No. 704,439

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408538; Aug. 22, 1984, 3430805

Int. Cl.[4] A01N *43/40, 43/60, 43/80, 43/84*

U.S. Cl. 514—253 8 Claims

1. A method of combating plant pathogenic fungi and bacteria which comprises applying to such fungi or bacteria a fungicidally or bactericidally effective amount of at least one salt of 3-keto-2H,3H-1,2-benzisothiazole 1,1-dioxide of the formula



R^1 represents hydrogen, alkyl having 1 to 18 carbon atoms, hydroxyalkyl having 1 to 3 carbon atoms, aminoalkyl having 1 to 3 carbon atoms, carboxyalkyl having 1 to 3 carbon atoms in the alkyl part, phenyl which is optionally monosubstituted or disubstituted by nitro or chlorine, cyclopentyl or cyclohexyl, or represent pyrimidine, 4-methylpyrimidine, 1,2,4-triazole, 1,2,3-triazole, or tetrahydropyran radicals which are optionally monosubstituted to tetrasubstituted by alkyl having 1 to 3 carbon atoms or monosubstituted to tetrasubstituted by hydroxyl,

R^2 represents alkyl having 1 to 18 carbon atoms, hydroxyalkyl having 1 to 3 carbon atoms, aminoalkyl having 1 to 3 carbon atoms, carboxyalkyl having 1 to 3 carbon atoms in the alkyl part, phenyl which is optionally monosubstituted or disubstituted by nitro or chlorine, cyclopentyl or cyclohexyl, or represent pyrimidine, 4-methyl pyrimidine, 1,2,4-triazole, 1,2,3-triazole, or tetrahydropyran radicals which are optionally monosubstituted to tetrasubstituted by alkyl having 1 to 3 carbon atoms or monosubstituted to tetrasubstituted by hydroxyl, or

R^1 and R^2, together with the nitrogen atom to which they are attached, form a pyrimidine, 1,2,4-triazole, 1,2,3-triazole, tetrahydropyran or tetrahydroxy tetrahydropyran radical, and

R^3 represents hydrogen, alkyl having 1 to 6 carbon atoms, amino, benzyl, hydroxyalkyl having 1 to 3 carbon atoms or

with the exception of the mono-, di- or triethanolamine compounds.

4,683,234

2,6-DIMETHYL-3N,5-DISUBSTITUTED-4-(SUBSTITUTED PHENYL)3,4-DIHYDROPYRIMIDINE COMPOUNDS AND A METHOD FOR TREATING DISORDERS OF CARDIOCIRCULAR SYSTEM

Hidetsura Cho, Ibaraki; Kazuo Aisaka, Osaka; Fumio Sato, Nagaokakyo, and Takafumi Ishihara, Toyonaka, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Mar. 6, 1985, Ser. No. 708,885

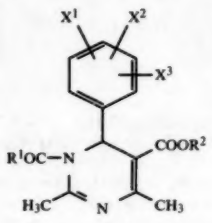
Claims priority, application Japan, May 19, 1984, 59-101569; May 26, 1984, 59-107004; Aug. 3, 1984, 59-163614

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/505;* C07D *239/20*

U.S. Cl. 514—256 13 Claims

1. A 2,6-dimethyl-3N,5-disubstituted-4-(substituted phenyl) 3,4-dihydropyrimidine compound of the formula: CHO et al—Serial No. 708,885



wherein X^1, X^2 and X^3 are the same or different and are hydrogen, nitro, Br, F, Cl, cyano, trifluoromethyl, methylthio or lower alkoxy, with the proviso that when one of X^1, X^2 and X^3 is nitro or cyano, the remainder are other than nitro and cyano;

R^1 is

(C_1–C_{13}) straight or branched alkoxy,

(C_4–C_{12}) straight or branched alkenyloxy,

(C_5–C_8) straight or branched alkynyloxy,

(C_1–C_4) straight or branched alkyl,

(C_3–C_6) cycloalkyl,

—O—$(CH_2)_n$—A wherein n is i, 2 or 3, A is cyclopropyl, cyclobutyl, cyclopentyl or (C_1–C_3) haloalkyl,

—O—$(CH_2)_m$—O—B wherein m is 1, 2, 3 or 4, B is (C_1–C_3) alkyl, or

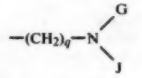
—O—$(CH_2)_l$—D wherein l is an integer from zero to 8, D is phenyl or substituted phenyl;

R^2 is

(C_1–C_{12}) straight or branched alkyl,

—$(CH_2)_p$—E wherein p is 1, 2 or 3, E is cyclopropyl, cyclobutyl or cyclopentyl,

(C_4–C_7) straight or branched alkenyl,



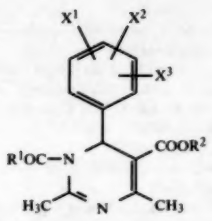
wherein q is 2, 3 or 4, G and J are the same or different and are phenyl, methyl, ethyl, isopropylbenzyl, phenethyl, methoxycarbonyl or ethoxycarbonyl, or

—$(CH_2)_r$—O—L wherein r is 1 or 2, L is methyl, ethyl or phenyl,

with the proviso that when R^1 is methoxy or ethoxy, R^2 is neither methyl nor ethyl, or

pharmaceutically acceptable acid addition salts of said compound.

12. A method for treating disorders of the cardiovascular system in a mammal comprising administering an effective amount of a 2,6-dimethyl-3N,5-disubstituted-4-(substituted phenyl) 3,4-dihydropyrimidine compound of the formula:



wherein

X^1, X^2 and X^3 are the same or different and are hydrogen, nitro, Br, F, Cl, cyano, trifluoromethyl, methylthio or lower alkoxy, with the proviso that when one of X^1, X^2 and X^3 is nitro or cyano, the remainder are other than nitro and cyano:

R^1 is

(C_1–C_{13}) straight or branched alkoxy,

(C_4–C_{12}) straight or branched alkenyloxy,

(C_5–C_8) straight or branched alkynyloxy,

(C_1–C_4) straight or branched alkyl,

(C_3–C_6) cycloalkyl,

—O—$(CH_2)_n$—A wherein n is 1, 2 or 3, A is cyclopropyl, cyclobutyl, cyclopentyl or (C_1–C_3) haloalkyl,

—O—$(CH_2)_m$—O—B wherein m is 1, 2, 3 or 4, B is (C_1–C_3) alkyl, or

—O—$(CH_2)_l$—D wherein l is an integer from zero to 8, D is phenyl or substituted phenyl;

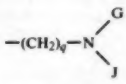
R^2 is

(i) (C_1–C_{12}) straight or branched alkyl,

(ii) (C_4–C_7) straight or branched alkenyl,

(iii) —$(CH_2)_p$—E wherein p is 1, 2 or 3, E is cyclopropyl, cyclobutyl or cyclopentyl,

(iv)



wherein q is 2, 3 or 4, G and J are the same or different and are phenyl, methyl, ethyl, isopropyl, benzyl, phenethyl, methoxycarbonyl or ethoxycarbonyl, or

(v) —$(CH_2)_r$—O—L wherein r is 1 or 2, L is methyl, ethyl or phenyl,

with the proviso that when R^1 is methoxy or ethoxy, R^2 is neither methyl nor ethyl, or a pharmaceutically acceptable acid addition salt of said compound to said mammal.

4,683,235

ANALGESIC METHOD

Martin D. Hynes, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 705,176, Feb. 25, 1985, abandoned. This application Jul. 25, 1986, Ser. No. 889,157

Int. Cl.[4] **A61K** *31/44, 31/135*

U.S. Cl. 514—282 **9 Claims**

1. A method of potentiating codeine analgesia in mammals which comprises the administration to said mammal of an effective potentiating amount of fluoxetine or norfluoxetine in the time range between 24 hours before and 2 hours after the administration of codeine.

4,683,236

CYCLOALKANOL ESTERS OF DIHYDROLYSERGIC ACID USEFUL AS $5HT_2$ RECEPTOR ANTAGONISTS

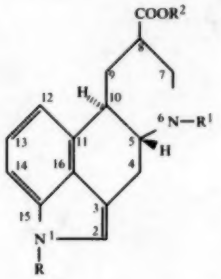
Kathleen R. Whitten, Zionsville; William L. Garbrecht, Indianapolis; Gifford P. Marzoni, Indianapolis, and C. John Parli, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 1, 1985, Ser. No. 782,337

Int. Cl.[4] **A61K** *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **3 Claims**

1. A method of blocking $5HT_2$ receptors which comprises administering to a mammal having an excess of serotonin centrally or peripherally an $5HT_2$ blocking dose of a compound of the formula



wherein R is primary or secondary C_{1-8} alkyl, CH_2-C_{2-4} alkenyl, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R^1 is C_{1-4} straight chain alkyl; and R^2 is C_{5-7} cycloalkyl or keto-substituted C_{5-7} cycloalkyl, and pharmaceutically-acceptable salts thereof.

4,683,237

FLUOROALKYL ESTERS OF DIHYDROLYSERGIC ACID USEFUL AS $5HT_2$ RECEPTOR ANTAGONISTS

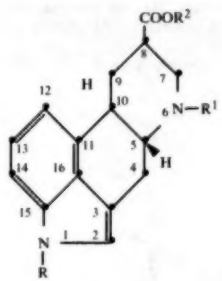
Gifford P. Marzoni, and William L. Garbrecht, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 20, 1985, Ser. No. 811,802

Int. Cl.[4] **A61K** *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **14 Claims**

1. A compound of the formula:



wherein R is primary or secondary C_{1-8} alkyl, C_{2-4} alkenyl-CH_2, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R^1 is allyl, H or C_{1-4} straight-chain alkyl; and R^2 is mono, difluoro or trifluoro C_{2-5} alkyl; and pharmaceutically-acceptable salts thereof.

4,683,238

2,3,4,9-TETRAHYDRO BETA CARBOLINE DERIVATIVES, USEFUL AS ANTIHYPERTENSIVE AGENTS

Gerd Schnorrenberg, Ingelheim am Rhein; Otto Roos, Schwabenheim; Walter Lösel; Ingrid Wiedemann, both of Gau-Algesheim; Wolfram Gaida, Ingelheim am Rhein, and Wolfgang Hoefke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

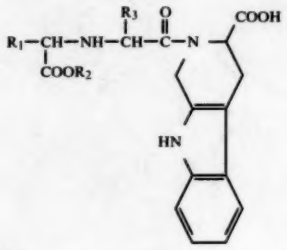
Division of Ser. No. 572,179, Jan. 19, 1984, Pat. No. 4,555,511. This application Jun. 27, 1985, Ser. No. 749,473

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302125

Int. Cl.[4] A61K *31/40;* **C07D** *471/04*

U.S. Cl. 514—292 **9 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl alkyl of 1 to 6 carbon atoms;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl.alkyl of 1 to 6 carbon atoms; and

R_3 is hydrogen or alkyl of 1 to 6 carbon atoms;

or a non-toxic, pharmacologically acceptable salt thereof.

9. The method of lowering the blood pressure of a warm-blooded animal in need thereof, which consists of perorally, parenterally or rectally administering to said animal an effective antihypertensive amount of a compound of claim **1**.

4,683,239

3-DIPHENYL SUBSTITUTED OCTAHYDROINDOLIZINE ANALGESIC COMPOUNDS

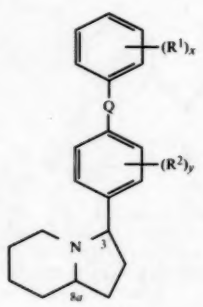
Richard J. Carmosin, Quakertown, and John R. Carson, Norristown, both of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.

Filed Apr. 10, 1986, Ser. No. 850,632

Int. Cl.[4] A61K *31/445;* **C07D** *221/04*

U.S. Cl. 514—299 **14 Claims**

1. An octahydroindolizine of the following formula (I):



(I)

wherein

Q is —NR—, —$(CH_2)_z$—, —CH=CH—, —C≡C—, —OCH_2—, —SCH_2—, —SO_2—, —SO—, —CO—, or an oxygen or a sulfur atom;

R is hydrogen or alkyl of about 1 to 4 carbons;

R^1 is independently amino, alkylamino of about 1 to 4 carbons, dialkylamino of about 1 to 4 carbons in each alkyl group, —SR^3, —SOR^4, —SO_2R^5, —$COOR^6$, —COR^7, —NR^8COR^9, alkyl of about 1 to 4 carbons, alkoxy of about 1 to 4 carbons, haloalkyl of about 1 to 4 carbons, nitro, cyano or halo;

R^2 is independently alkyl of about 1 to 4 carbons, alkoxy of about 1 to 4 carbons, halo, haloalkyl of about 1 to 4 carbons, alkylthio of about 1 to 4 carbons or cyano;

R^3 is hydrogen or alkyl of about 1 to 4 carbons;

R^4 is alkyl of about 1 to 4 carbons;

R^5 is alkyl of about 1 to 4 carbons;

R^6 is alkyl of about 1 to 4 carbons;

R^7 is hydrogen or alkyl of about 1 to 4 carbons;

R^8 is hydrogen or alkyl of about 1 to 4 carbons;

R^9 is hydrogen or alkyl of about 1 to 4 carbons;

x is the integer 0, 1, 2 or 3;

y is the integer 0, 1, 2 or 3; and

z is the integer 0, 1, 2 or 3,

and the pharmaceutically-acceptable acid-addition salts thereof.

4,683,240

PHARMACEUTICAL COMPOSITION CONTAINING AN IMIDAZOLIDINETRIONE DERIVATIVE OR PHARMACEUTICALLY ACCEPTABLE SALT THEREOF

Kazuharu Ienaga; Ko Nakamura, and Akira Ishii, all of Hyogo, Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

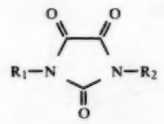
Filed Feb. 6, 1986, Ser. No. 826,607

Claims priority, application Japan, Feb. 6, 1985, 60-22559

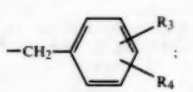
Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—390 **9 Claims**

1. A pharmaceutical composition for use in treating diabetes and hyperlipidemia comprising as an active ingredient an effective amount of at least one imidazolidinetrione derivative of the formula:



wherein each of R_1 and R_2, which may be the same or different, is hydrogen, an alkyl group, a cycloalkyl group or



and each of R_3 and R_4, which may be the same or different, is hydrogen, halogen, a nitro group, a lower alkyl group or a lower alkoxy group, or a pharmaceutically acceptable salt thereof, and an inert carrier or diluent.

4,683,241

PHENOLIC ESTER DERIVATIVES AS ELASTASE INHIBITORS

Masateru Miyano, Northbrook, and James R. Deason, Wilmette, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed May 21, 1984, Ser. No. 612,193
Int. Cl.[4] A61K *31/265, 31/22*
U.S. Cl. 514—512 1 Claim

1. A method for promoting an elastase inhibitory anti-inflammatory effect in a mammal in need thereof comprising administering thereto an elastase inhibitory anti-inflammatory effective amount of a compound selected from the group consisting of 4-pivaloyloxybenzophenone, 4,4'-dipivaloyloxybenzophenone, 4,4'-diisopropionyloxybenzophenone, 2,4, 4'-tripivaloyloxybenzophenone, 2,2', 4,4'-tetrapivaloyloxybenzophenone, 4,4'-dipivaloyloxyazobenzene, 4-pivaloyloxy-4'-chlorobenzophenone, 4,4'-α,α-dimethylvaleroyloxybenzophenone, 3, 4, 5, 4', 5' 6'-hexapivaloyloxybenzophenone,2,4-dipivaloyloxybenzophenone, 4,4'-di(t-butyl)oxycarbonyloxybenzophenone, 4,4'-dipivaloyloxydiphenylether, 4,4'-dipivaloyloxydiphenylsulfone, 3-methallyl-4-pivaloyloxybenzophenone, 3-allyl-4-pivaloyloxybenzophenone, 3-(1-methylallyl)-4-pivaloyloxybenzophenone, 3-(3-hydroxypropyl)-4-pivaloyloxybenzophenone, 4-isobutyryloxybenzophenone, and 4,4'-dipivaloyloxydiphenylmethane or the pharmaceutically acceptable non-toxic salts thereof.

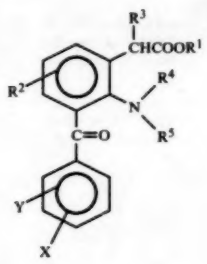
4,683,242

TRANSDERMAL TREATMENT FOR PAIN AND INFLAMMATION WITH 2-AMINO-3-AROYLBENZENEACETIC ACIDS, SALTS AND ESTERS

Richard G. Poser, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Oct. 28, 1985, Ser. No. 792,269
Int. Cl.[4] A61K *31/24, 31/195*
U.S. Cl. 514—539 80 Claims

1. A method of treating animals or humans to alleviate pain or inflammation by applying to the skin of said animals or humans a transdermal preparation comprised of a pharmaceutical carrier containing therein a pain or inflammation alleviating amount of compound of the formula:



wherein;

R^1 is hydrogen, loweralkyl or a pharmaceutically acceptable cation;

R^2 is hydrogen, halogen, loweralkyl or loweralkoxy;

R^3, R^4 and R^5 are hydrogen or loweralkyl;

X is hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy, nitro, trifluoromethyl or S-loweralkyl; and

Y is hydrogen, loweralkyl, loweralkoxy, nitro or trifluoromethyl; and the hydrates thereof.

4,683,243

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING DIPHENHYDRAMINE AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks, Inc., Wilton, Conn.

Division of Ser. No. 711,525, Mar. 14, 1985, Pat. No. 4,585,783, which is a division of Ser. No. 578,288, Feb. 8, 1984, Pat. No. 4,522,826. This application Apr. 28, 1986, Ser. No. 856,414
Int. Cl.[4] A61U *31/19, 31/135*
U.S. Cl. 514—557 26 Claims

1. A method for eliciting an enhanced analgesic and anti-inflammatory response in a mammalian organism in need of such treatment, comprising administering to such organism

(i) an analgesically and anti-inflammatorily effective amount of diflunisal or flufenisal or pharmaceutically acceptable salt thereof, and

(ii) an analgesically and anti-inflammatorily potentiating amount of diphenhydramine.

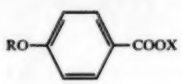
4,683,244

SEBOSUPPRESSIVE COSMETIC PREPARATIONS CONTAINING ALKOXY OR ALKYLBENZYLOXY BENZOIC ACIDS OR THEIR SALTS

Hinrich Moeller, and Siegfried Wallat, both of Monheim, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 818,502
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1985, 3500972
Int. Cl.[4] C07C *65/00*
U.S. Cl. 514—568 21 Claims

1. A sebosuppressive cosmetic composition containing a solution, mixture, or dispersion, in a base comprising at least one of water, alcohol, or oil, of an antiseborrheically effective amount of a p-alkoxy or p-alkylbenzyloxy benzoic acid, or a salt thereof, corresponding to the following formula:



wherein R is either an alkyl group having from 6 to 18 carbon atoms, or an alkylbenzyl group wherein the alkyl moiety has from 3 to 9 carbon atoms, and X is a member selected from the group consisting of hydrogen, an alkali metal, an alkaline earth metal and ammonium.

4,683,245

LAEVOROTATORY ANTIPODE OF MOPROLOL AS AN ANTIHYPERTENSIVE

Giorgio Ferrari, and Vittorio Vecchietti, both of Milan, Italy, assignors to SIMES S.p.A. Societa Italiana Medicinali e Sintetici, Milan, Italy

Continuation-in-part of Ser. No. 371,428, Apr. 23, 1982, abandoned, which is a continuation of Ser. No. 123,770, Feb. 20, 1980, abandoned. This application Oct. 14, 1982, Ser. No. 434,362
Claims priority, application Italy, Mar. 1, 1979, 20671 A/79
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—652 3 Claims

3. A method for a long-term treatment of hypertension comprising administering to a hypertensive patient requiring said treatment an effective amount of the laevorotatory form of moprolol or of a pharmaceutically acceptable salt thereof.

4,683,246

POLYURETHANE FOAM-FIBER COMPOSITES

Gregory B. Davis, Monkton, and Michael S. Buchanan, Baltimore, both of Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Filed Mar. 14, 1986, Ser. No. 839,714
Int. Cl.[4] C08J 9/36; C08L 75/00
U.S. Cl. 521—54 33 Claims

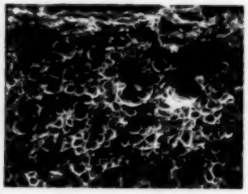
1. A polyurethane foam-fiber composite structure obtained through the steps of (a) providing an admixture of flexible polyurethane foam and a fibrous material; (b) uniformly applying to said mixture of (a) a liquid flexible resinous binding agent, and (c) curing said composition of (b) so as to provide a cured foam structure; the relative amounts of materials in said foam structure being such that for each 100 parts by weight of polyurethane foam particles about 10 to 500 parts of fibrous material and about 10 to 250 parts of binding agent is employed, said fibrous material having a fiber length of from $\frac{1}{4}$" to 4", a density of at least 0.75, and a diameter of less than 500 microns.

4,683,247

FOAMABLE THERMOPLASTIC COMPOSITIONS, FOAMED ARTICLES AND FOAMING METHOD BASED ON PRE-COMPOUNDED NUCLEATING AGENT-RESIN CONCENTRATE

Richard B. Allen, Dalton, Mass., and Roger W. Avakian, Brasschaat, Belgium, assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1984, Ser. No. 687,577
Int. Cl.[4] C08J 9/12
U.S. Cl. 521—91 17 Claims



1. A foamable thermoplastic feedstock, comprising
(a) a thermoplastic matrix polymer selected from the group consisting of aromatic polycarbonates, poly (ester-carbonates), polyesters, polyetherimides and mixtures of an aromatic polycarbonate and an acrylonitrile-butadiene-styrene copolymer;
(b) a pre-extruded blend of (i) a carrier polymer which may be the same as or different than (a) and (b)(ii) an inorganic non-fibrous particulate foam nucleating agent; and
(c) a minor, effective amount of a foaming agent, the amounts of (b)(ii) and (c) being sufficient to provide a rigid, substantially uniform cellular core within a solid integral skin.

4,683,248

CROSSLINKING OF STYRENE POLYMERS

Kurt Rauer, and Angelika Orner, both of Gunzburg, Fed. Rep. of Germany, assignors to Luperox GmbH, Gunzburg, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 782,834
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1984, 3436877
Int. Cl.[4] C08J 9/06
U.S. Cl. 521—96 4 Claims

1. A process of crosslinking and foaming a homopolymer or copolymer selected from the group of polystyrenes, nucleo-substituted polystyrenes, impact-resistant polystyrenes, or mixtures thereof with the exception of p-methylstyrene homopolymers containing a chemically decomposing blowing agent free of amino or hydrazine groups comprising heating said homo- or copolymer at a temperature above 110° C. in the presence of 0.5 to 15% of at least one crosslinking promoter containing at least two active C—C double or C—C triple bonds in the molecule, 0.5 to 15% of at least one organic peroxide having a 10 hour halflife temperature below 106° C. (as determined in benzene) selected from the group of peresters, percarbonate esters, perketals, ether peroxides, diacyl peroxides, and ketone peroxide esters, and optionally foaming agents.

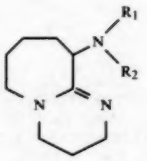
4,683,249

AMIDINES AND A METHOD OF MANUFACTURING THE SAME

Keiichi Nakatani, Kyoto; Shohzo Ohnishi, Sakura, and Tadamasa Kurosaki, Ohtsu, all of Japan, assignors to San-Apro Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 8, 1986, Ser. No. 850,448
Claims priority, application Japan, Apr. 9, 1985, 60-76209; Jul. 15, 1985, 60-156341
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—129 8 Claims

1. An amidine compound represented by the following formula



wherein each R_1 and R_2 is independently an alkyl group having C_1 to C_{14} or benzyl group and the sum of carbon atoms is 2 to 16.

4,683,250

ROOM-TEMPERATURE-CURABLE SILICON-MODIFIED POLYETHER COMPOSITION

Ryuzo Mikami, Midland, Mich., assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1986, Ser. No. 935,885
Claims priority, application Japan, Dec. 27, 1985, 60-295339
Int. Cl.[4] C08F 2/46
U.S. Cl. 522—33 6 Claims

1. Room temperature-curable composition comprising
(A) 100 parts by weight of silicone-modified polyether having at its molecular chain terminals at least one unit of the formula

$$-SiX_{3-a}(R_a)$$

in which R represents a monovalent hydrocarbon group, X represents a hydrolyzable group and a is an integer with a value of 0 to 2, whose main chain is essentially composed of chemically bonded repeating units of the formula—R-'O— in which R' represents a divalent alkylene group and whose molecular weight is from 500 to 15,000 and
(B) 0.1 to 50 parts by weight of ester whose principal component is an ester of unsaturated higher fatty acid with alcohol, wherein the fatty acid has at least 10 carbon atoms in the molecule.

4,683,251

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION CONTAINING A PHOTOSENSITIZER

Ryuzo Mikami, Midland, Mich., assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,516
Int. Cl.[4] C08F 2/13
U.S. Cl. 522—46 9 Claims

1. A room temperature-curable organopolysiloxane composition comprising

(a) 100 parts by weight of an essentially straight-chain organopolysiloxane having silanol or silicon-bonded hydrolyzable groups at the molecular chain ends and having a viscosity at 25° C. in the range of 0.0001 to 1.0 m^2/s,

(b) 0.1 to 40 parts by weight of a crosslinking agent consisting of an organosilicon compound having at least two silicon-bonded hydrolyzable groups per molecule,

(c) 5 to 400 parts by weight of a filler,

(d) optionally a curing catalyst,

(e) 0.1 to 50 parts by weight of an ester compound derived from unsaturated fatty acids having at least ten carbon atoms and alcohols, and

(f) 0.01 to 20 parts by weight of a photosensitizer.

4,683,252

PHENOLIC RESIN-POLYISOCYANATE BINDER SYSTEMS CONTAINING AN ORGANOHALOPHOSPHATE AND USE THEREOF

William R. Dunnavant, Columbus; Robert B. Fechter; John J. Gardikes, both of Worthington, and Heimo J. Langer, Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 25, 1986, Ser. No. 832,687
Int. Cl.[4] C08K 5/51
U.S. Cl. 523—143 13 Claims

1. A binder composition comprising in admixture a resin component, a hardener component, and an organohalophosphate, wherein at least one halo group is directly attached to the phosphorus, said resin component including a non-aqueous phenolic resin and said hardener component comprising a polyisocyanate containing at least two isocyanate groups.

4,683,253

RESIN MOLDING COMPOUND FOR SEALING ELECTRONIC PARTS

Yoshifumi Miyake, and Sumio Sakka, both of Hirakata, Japan, assignors to Risho Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 12, 1986, Ser. No. 829,095
Claims priority, application Japan, Feb. 12, 1985, 60-25921
Int. Cl.[4] C08K 3/22
U.S. Cl. 523—442 3 Claims

1. A resin molding compound for sealing electronic parts which comprises

(1) a synthetic resin, and

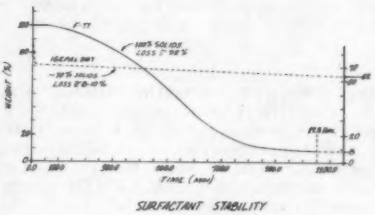
(2) from 100 to 600 parts per 100 parts of synthetic resin of at least one synthetic inorganic metal oxide produced by hydrolyzing a purified metal alkoxide having hydrolyzable groups, drying the resultant product, pulverizing the dried product and thermally oxidizing the pulverized product, the synthetic inorganic metal oxide having an average particle size of 0.5 to 120 μm and said inorganic metal oxide containing radioactive elements in an amount of 1 part per billion or less and containing sodium and potassium in an amount of 1 part per million or less.

4,683,254

SIZE COMPOSITIONS FOR GLASS FIBERS

Robert C. Brannon, Newark, Ohio; Donald B. Sage, Jr., Jackson, Tenn., and David G. Miller, Pataskala, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 21, 1985, Ser. No. 789,894
Int. Cl.[4] C08K 5/54
U.S. Cl. 523—503 15 Claims



SURFACTANT STABILITY

1. An aqueous size composition consisting essentially of, by weight percent:

	Weight Percent
A cure, stable polyester emulsion of an unsaturated polyester emulsified with nonylphenoxypoly (ethyleneoxy) ethanol	50–55
Polyvinylacetate copolymer	40–45
Acetic acid	0–0.3
Silane	2–4
Static insensitive lubricant	0.05–2
Wax	0–3
Water	Balance

4,683,255

POLYPHENYLENE ETHER RESIN COMPOSITION HAVING EXCELLENT FIRE RETARDANCY

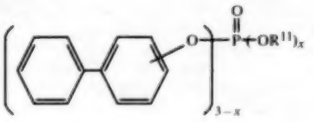
Akitoshi Sugio; Masao Okabe, and Akikazu Amagai, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,756
Claims priority, application Japan, Feb. 27, 1985, 60-37846; Feb. 28, 1985, 60-39983
Int. Cl.[4] C08K 5/51, 5/52
U.S. Cl. 524—151 6 Claims

1. A polyphenylene ether resin composition having excellent first retardancy comprising

(A) a polyphenylene ether resin, and

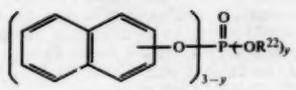
(B) at least one phosphate compound selected from the group consisting of biphenylyl phosphate compounds represented by the following formula



(B1)

wherein x is 1 or 2, and R^{11} represents a linear or branched alkyl group having 1 to 8 carbon atoms or a phenyl group, provided that the biphenyl group and phenyl group may each be substituted by an alkyl group having 1 to 3 carbon atoms, and

naphthyl phosphate compounds represented by the following formula



(B2)

wherein y is 1 or 2, and R^{22} represents a linear or branched alkyl group having 1 to 8 carbon atoms or a phenyl group, provided that the naphthyl group and phenyl group may each be substituted by an alkyl group having 1 to 3 carbon atoms.

4,683,256

DRY EDIBLE FILM COATING COMPOSITION, METHOD AND COATING FORM

Stuart C. Porter, Hatfield, and Edward J. Woznicki, Douglassville, both of Pa., assignors to Colorcon, Inc., West Point, Pa.

Division of Ser. No. 202,831, Nov. 6, 1980, Pat. No. 4,543,370, which is a continuation-in-part of Ser. No. 98,531, Nov. 29, 1979, abandoned. This application Jul. 29, 1985, Ser. No. 759,673

Int. Cl.[4] C08J *3/12*

U.S. Cl. 524—285 **33 Claims**

1. A method of making a coating dispersion for use in pharmaceuticals, confectionery and food, comprising the steps of

dry mixing a powder of film forming polymer and powdered pigment particles in a blender,

mixing a surfactant into a plasticizer,

adding the surfactant-plasticizer mix to the blender containing the polymer-pigment mix and dry mixing until the combined mix is blended to form a dry edible film coating composition,

and dispersing the dry edible film coating composition into a solvent to form a coating dispersion adapted for use as a film coating for tablets and the like.

4,683,257

RUBBER COMPOSITIONS FOR SOLID GOLF BALLS

Shinichi Kakiuchi, Kodaira; Tasuku Saito, and Seisuke Tomita, both of Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 872,879

Claims priority, application Japan, Jun. 12, 1985, 60-125968

Int. Cl.[4] A63B *37/00, 37/06;* **C08K** *3/20;* **C08L** *9/00*

U.S. Cl. 524—432 **5 Claims**

1. A rubber composition, for use in forming one-piece golf balls or the core of multiple solid golf balls, comprising

(1) a polybutadiene having at least 10% of cis-1,4 bond,

(2) an unsaturated carboxylic acid and/or a salt thereof capable of producing crosslinking in the polybutadiene,

(3) an inorganic filler, and

(4) an organic peroxide,

wherein said polybutadiene consists essentially of a blend of

(A) a polybutadiene synthesized in the presence of a nickel and/or cobalt base catalyst and having a Mooney viscosity ML_{1+4}(100° C.) or 70 to 100 and

(B) a polybutadiene synthesized in the presence of a lanthanide rare earth element base catalyst and having a Mooney viscosity ML_{1+4}(100° C.) or 30 to 90, and

wherein said components (A) and (B) are blended such that more than 50 parts by weight to 90 parts by weight of said components (A) and less than 50 parts by weight to 10 parts by weight of said component (B) are present per 100 parts by weight of said blended components (A) and (B);

or wherein said polybutadiene consists essentially of a blend of

(A) a polybutadiene synthesized in the presence of a nickel and/or cobalt base catalyst and having a Mooney viscosity ML_{1+4}(100° C.) or 70 to 100 and

(C) a polybutadiene synthesized in the presence of a nickel and/or cobalt base catalyst and having a Mooney viscosity ML_{1+4}(100° C.) of 20 to 50, and

wherein said components (A) and (C) are blended such that 80 to 20 parts by weight of said component (A) and 20 to 80 parts by weight of said component (C) are present per 100 parts by weight of said blended components (A) and (C).

4,683,258

AGENT FOR ABSORBING AND RELEASING WATER VAPOR

Hiroshi Itoh, Yokohama; Toshimi Nakagawa, Fujisawa; Atsuhiko Nitta, Yokohama; Tomio Tanaka, Tokyo; Hideo Kamio, Odawara; Ryosuke Enoshita, Nagoya; Tamotu Uejima, Tohkai; Takahiro Ouchi, Tokyo; Kazuki Abe, and Sadao Kobayashi, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 724,163, Apr. 17, 1985, abandoned. This application Jan. 17, 1986, Ser. No. 820,887

Claims priority, application Japan, May 28, 1984, 59-106463; May 28, 1984, 59-106468; May 28, 1984, 59-106550; May 28, 1984, 59-106551; May 28, 1984, 59-106554

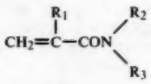
Int. Cl.[4] C08K *3/18*

U.S. Cl. 524—434 **9 Claims**

1. A process of humidity control by contacting humid gas with an agent for absorbing and releasing water vapor, said agent comprising the combination of:

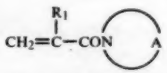
(A) from 95 to 3 wt. % of a water insolubilized product prepared from:

(a) a homopolymer of a monomer selected from the group consisting of N-alkyl- and N-alkylene-substituted (meth)acrylamides of formula (I):



(I)

wherein R_1 is hydrogen or methyl, R_2 is hydrogen, methyl or ethyl, and R_3 is methyl, ethyl or propyl and formula (II):



(II)

wherein R_1 is hydrogen or methyl, and A is $(—CH_2—)_n$, wherein n is an integer of 4 to 6, or $—CH_2)_2—O—(CH_2)_2$;

(b) a first copolymer of at least two monomers selected from the group consisting of said N-alkyl- and N-alkylene-substituted (meth)acrylamides; or

(c) a second copolymer of at least one monomer selected from the group consisting of said N-alkyl- and N-alkylene-substituted (meth)acrylamides and at least one monomer other than said N-alkyl- and N-alkylene-substituted (meth-)acrylamides which is copolymerizable with the N-alkyl- and N-alkylene-substituted (meth)acrylamides; and

(B) from 5 to 97% by wt. of a hygroscopic material selected from the group consisting of metal halides and metal perchlorates.

4,683,259

RESIN COMPOSITIONS COMPRISING ORGANOCLAYS OF IMPROVED DISPERSIBILITY

Howard Goodman, St. Austell, United Kingdom, assignor to ECC International Limited, St. Austell, England

Continuation-in-part of Ser. No. 765,259, Aug. 13, 1985, Pat. No. 4,631,091. This application Nov. 7, 1986, Ser. No. 928,847

Int. Cl.[4] C08K *3/34;* **C04B** *14/00*

U.S. Cl. 524—447 **15 Claims**

1. Resin compositions comprising a resin and a readily dispersible organoclay, said organoclay being prepared by a method comprising the steps of:

(a) suspending a smectite clay in water to form an aqueous suspension;

(b) treating said aqueous suspension of the smectite clay with a solution of an inorganic salt, wherein the cation of said inorganic salt has a valency of at least 2, the concentration of the salt being such as to flocculate the smectite clay substantially completely;

(c) mixing the suspension of the flocculated smectite clay with a quaternary ammonium compound at least one of the four alkyl groups of which has from 10 to 24 carbon atoms; and

(d) dewatering the product of step (c).

4,683,260

CLEAR TOPCOAT COATINGS FOR WOOD

Frank A. Wickert, Olmsted Township, Lorain County, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Division of Ser. No. 793,188, Oct. 31, 1985, abandoned. This application Oct. 29, 1986, Ser. No. 924,280

Int. Cl.[4] C08J *31/00*

U.S. Cl. 524—512 **2 Claims**

1. A clear coating composition for application to wood and plywood paneling which comprises:

(A) 1 to 6 parts by volume (solids) of an aqueous emulsion consisting of a mixture of

(1) a film forming aqueous acrylic polymer latex having a Tg of from about 0° C. to about 30° C. having reactive functionality adapted to cure with a crosslinking agent under baking conditions of from about 100° F. to about 260° F.; and

(2) a non-film forming plastic pigment emulsion latex having a Tg greater than about 55° C. and present in the mixture in an amount at least 40 volume percent basis polymer solids and derived by the aqueous emulsion polymerization of ethylenically unsaturated monomer optionally containing up to 2 weight percent (basis monomer solids) of copolymerized acid monomer selected from acrylic or methacrylic acid.

(B) 1 part glycoluril crosslinking agent.

4,683,261

ACRYLONITRILE POLYMER FILM AND PROCESS FOR PREPARING SAME

Akio Inoue, and Tsuneaki Tanabe, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 775,712, Sep. 13, 1985, abandoned, which is a continuation of Ser. No. 509,253, Jun. 29, 1983, abandoned. This application May 5, 1986, Ser. No. 859,111

Claims priority, application Japan, Jul. 5, 1982, 57-116489; Jul. 8, 1982, 57-119106

Int. Cl.[4] C08F *20/44*

U.S. Cl. 524—566 **4 Claims**

1. An acrylonitrile polymer film comprising at least 85% by weight of acrylonitrile and having a tensile elongation of 28% to 55% and an impact strength of 4.2 kg.cm to 5.4 kg.cm, wherein the difference in the value of the second moment of the broad-line NMR spectrum of 20% between the film and the starting polymer powder used for the preparation thereof, or the polymer powder formed by dissolving the film and then precipitating the polymer from the solution is from 0.3 to 2 Gauss^2 and the infrared dichroic ratio of the nitrile groups satisfies the requirements that $0.4<Ax/Az<0.8$, $0.4<Ay/Az<0.8$, and $0.8<Ax/Ay<1.25$, where Ax and Ay stand for the absorption intensities of polarized infrared rays oscillating in respective directions parallel to the surface of the film and perpendicular to each other, and Az stands for the absorption intensity of polarized infrared rays oscillating in the direction perpendicular to the surface of the film, produced by coagulating a solution of an acrylonitrile polymer in an aqueous coagulating bath, adjusting the water content of the obtained water-containing coagulated film to from 20 to 100% by weight based on the weight of the dry polymer, stretching the film in the longitudinal direction using rolls having a surface temperature of 65° to 95° C., then stretching the film in the transverse direction at a water content of from 10 to 40% by weight based on the weight of the dry polymer, which is lower than the water content in the longitudinal stretching step, in an atmosphere maintained at 100° to 180° C. by using a tenter.

4,683,262

NON-DIMER ACIDIC POLYAMIDE FROM MEDIUM CHAIN DIACID HAVING IMPROVED WATER SOLUBILITY USEFUL AS FLEXOGRAPHIC/GRAVURE INK BINDER

Paul D. Whyzmuzis, Plymouth, and John M. Menke, New Brighton, both of Minn., assignors to Henkel Corp., Minneapolis, Minn.

Continuation-in-part of Ser. No. 701,903, Feb. 15, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,090

Int. Cl.[4] C08G *69/20;* **C08D** *11/02*

U.S. Cl. 524—608 **20 Claims**

1. A polyamide resin obtained from the reaction of

(A) an acid component substantially free of a polymeric fat acid comprised of a medium chain dicarboxylic acid of the formula HOOC—R_1—COOH where R_1 is a divalent aliphatic hydrocarbon radical containing from 10–24 carbon atoms and

(B) an amine component comprised of a diamine of the formula

$$H_2N—R—NH_2$$

where R is a divalent aliphatic hydrocarbon radical having from 2–12 carbon atoms

wherein the ratio of amine equivalents of said amine component to the carboxyl equivalents in said acid component is less than one so as to provide a resin having an acid value greater than 30 and the acid value exceeds the amine value by at least 20.

4,683,263

METAL VESSEL HAVING CIRCUMFERENTIAL SIDE SEAM AND ADHESIVE PRIMER FOR USE IN PRODUCTION THEREOF

Kazuo Taira, Tokyo; Akihiko Morofuji; Seishichi Kobayashi, both of Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Division of Ser. No. 544,266, Oct. 21, 1983, Pat. No. 4,556,151. This application May 7, 1985, Ser. No. 731,384

Claims priority, application Japan, Oct. 25, 1982, 57-186110; Oct. 28, 1982, 57-188140

Int. Cl.[4] C08L *27/06, 63/00*

U.S. Cl. 525—57 **7 Claims**

1. An adhesive primer for a metal vessel, which comprises a composition containing (A) 10 to 80% by weight, based on solids, of particles of a vinyl chloride resin having a polymerization degree of 800 to 4,000 and a particle size of 0.01 to 10 microns, (B) 10 to 80% by weight, based on solids, of a solvent-soluble vinyl chloride/vinyl acetate/carboxyl group- or hydroxyl group-containing vinyl unit copolymer containing carboxyl groups and/or hydroxyl groups at a concentration of 5 to 500 millimoles/100 g of the polymer, the vinyl chloride units being present in an amount of 50 to 95% by weight based on the copolymer (B) and the vinyl acetate units being present in an amount of 2 to 40% by weight based on the copolymer (B), and said copolymer (B) having a polymerization degree of 80 to 1,500 and a molecular weight lower than that of the vinyl chloride resin particles (A), and (C) 2 to 30% by weight, based on solids, of a solvent-soluble thermosetting resin having a reactivity with carboxyl groups and/or hydroxyl groups, said thermosetting resin (C) comprising (i) an epoxy resin derived from bisphenol A and epichlorohydrin and having a molecular weight of 250 to 4,000 and an epoxy equivalent of 180 to 3,500 and (ii) a phenolic resin or amino resin at a weight ratio ((i)/(ii)) of from 95/5 to 20/80, wherein said copolymer (B) and said

thermosetting resin (C) are present in a continuous phase as the dispersion medium and the vinyl chloride resin particles (A) are present as the dispersed phase dispersed in said continuous phase.

4,683,264

HARDENABLE COATING COMPOSITION FOR POLYPROPYLENE RESINS

Keiji Urata, and Yoshio Kurome, both of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 645,103, Aug. 28, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 849,441

Claims priority, application Japan, Apr. 23, 1984, 59-80126

Int. Cl.[4] **C08L** *51/04, 63/02*

U.S. Cl. 525—65 **3 Claims**

1. A hardenable coating composition for polypropylene resins which is obtained by

modifying a polyolefin resin having a molecular weight of from 12,000 to 200,000, wherein said polyolefin contains from 10 to 40 or greater than 80 weight percent of propylene, with at least one unsaturated polycarboxylic acid or an anhydride of said acid, to produce a solid modified polyolefin having a saponification value of from about 6 to 60,

chlorinating said solid modified polyolefin to a degree of from about 10% to 50% by weight of chlorine content to produce a chlorinated modified polyolefin, and

partially crosslinking carboxyl groups or acid anhydride groups on said chlorinated modified polyolefin with an epoxy group of a compound which has at least two epoxy groups per molecule.

4,683,265

THERMOPLASTIC MOULDING COMPOSITIONS CONSISTING OF POLYCARBONATES, GRAFT POLYMERS AND COPOLYMERS

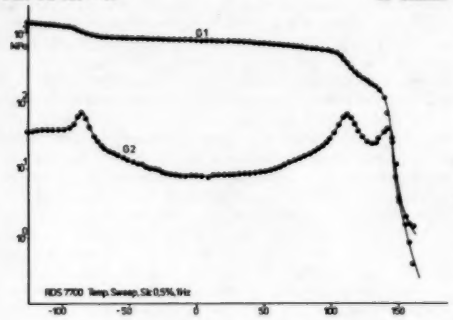
Hans-Jürgen Kress, Krefeld; Christian Lindner; Leo Morbitzer, both of Cologne; Horst Peters; Karl-Heinz Ott, both of Leverkusen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Apr. 7, 1986, Ser. No. 848,587

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, 3514185

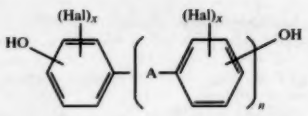
Int. Cl.[4] **C08L** *69/00*

U.S. Cl. 525—67 **13 Claims**



1. A thermoplastic moulding composition containing

(A) 20 to 80 parts by weight of an aromatic, thermoplastic polycarbonate based on diphenols of the general formula



(I)

wherein

A denotes a single bond, a C_1–C_5-alkylene, a C_2–C_5-alkylidene, a C_5–C_6-cycloalkylidene, —S— or —SO_2—,

Hal denotes chlorine or bromine,

x is 0, 1 or 2 and

n is 1 or zero,

(B) 10 to 60 parts by weight of graft polymer(s) (B.1), (B.2) or both, where

(B.1) is obtainable by grafting 5 to 90 parts of a mixture of

(i) 30 to 40% by weight α-methylstyrene, 52 to 62% by weight methyl methacrylate and 4 to 14% by weight acrylonitrile, the sum of the percentages by weight being 100 in each case, onto

(ii) 95 to 10 parts by weight of a rubber having a glass transition temperature $T_G \leqq 10°$ C., and where

(B.2) is obtainable by grafting 5 to 90 parts by weight of a mixture of

(i) 50 to 95% by weight of styrene, α-methylstyrene, styrene which is substituted in the nucleus, methyl methacrylate or mixtures of these, and

(ii) 5 to 50% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures of these onto

(iii) 95 to 10 parts by weight of a rubber having a glass transition temperature $T_G \leqq 10°$ C., and

(C.) 10 to 70 parts by weight of thermoplastic copolymer(s) (C.1), (C.2) or both, where

(C.1) is obtainable by copolymerisation of 30 to 40% by weight of α-methylstyrene, 52 to 62% by weight methyl methacrylate and 4 to 14% by weight acrylonitrile, the sum of the percentages by weight again being 100 in each case, and where

(C.2) is obtainable by copolymerisation of

(i) 50 to 95% by weight of styrene, α-methylstyrene, styrene which is substituted in the nucleus, methyl methacrylate or mixtures of these and

(ii) 5 to 50% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures of these,

where

1. the sum of the number of parts by weight of components (A)+(B)+(C) is always 100,
2. where polymers (B.1) and (*B.2*) are present simultaneously, the weight ratio of (B.1) to (B.2) is between 50:50 and 95:5,
3. where polymers (C.1) and (C.2) are present simultaneously, the weight ratio of (C.1) to (C. 2) is also between 50:50 and 95:5, and
4. either (B.1) or (C.1), or both (B.1) and (C.1) must be present in the moulding composition.

4,683,266

COMPOSITIONS THICKENED THROUGH URETHANE REACTION

Anthony C. Palermo; Roger M. Christenson, both of Gibsonia, Pa., and Glenn L. Mazza, Milford, Mich., assignors to Ashland Oil, Inc., Russell, Ky.

Continuation of Ser. No. 713,122, Mar. 18, 1985, abandoned, which is a continuation of Ser. No. 500,585, Jun. 2, 1983, abandoned. This application Nov. 7, 1985, Ser. No. 796,031

Int. Cl.[4] **C08F** *8/00*; **C08L** *75/00*

U.S. Cl. 525—123 **5 Claims**

1. In a method for preparing a sheet molding compound composition wherein the composition which is curable by free-radical initiated polymerization consists essentially of

(a) from 25–55 weight percent of a multifunctional acrylate or methacrylate ester of a polyol having 2–5 hydroxyl groups,

(b) from 10–25 weight percent of an active hydrogen containing polydiene polymer having a molecular weight between 1,000 and 5,000, and

(c) from 20–50 weight percent of a C_1–C_4 alkyl ester of acrylic or methacrylic acid; the improvement which comprises incorporating into said composition a polyisocyanate in an amount sufficient to thicken said composition to a viscosity of from $2\times10^6-160\times10^6$ centipoise and in an amount such that the NCO to OH equivalent ratio of said composition is within the range of 0.05 to 1.5:1.

4,683,267

THERMOPLASTIC MOULDING COMPOUNDS BASED ON POLYOXYMETHYLENE AND POLYMERIC ADIPATECARBONATE MIXED ESTERS

Christian Lindner, Cologne; Karola Brudermanns, Leverkusen; Helmut Waniczek, Cologne; Walter Uerdingen, and Helmut Hurnik, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,636

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421864

Int. Cl.[4] C08L *61/02*

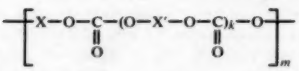
U.S. Cl. 525—133 **3 Claims**

1. A moulding composition which comprises:

(A) from 99.99 to 60 parts, by weight, of a polyoxymethylene;

(B) from 0 to 40 parts, by weight, of an elastomer having a softening temperature below the crystallite melting point of (A) and a freezing temperature below 0° C.; and

(C) from 0.01 to 40 parts, by weight, of an aliphatic, high molecular weight adipate-carbonate mixed ester corresponding to:



wherein

X and X′ represent residues of the reaction product of a polyhydric alcohol and adipic acid having a molecular weight of from 800 to 3,500;

k represents an integer of from 0 to 10; and

m represents and integer greater than 20.

4,683,268

PRESSURE SENSITIVE ADHESIVE USING LIGHT COLOR, LOW SOFTENING POINT PETROLEUM HYDROCARBON RESINS

Mary E. Ahner, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 18, 1986, Ser. No. 830,410

Int. Cl.[4] C08L *47/00*

U.S. Cl. 525—237 **9 Claims**

1. An adhesive composition comprising from about 20% to about 80% by weight of a copolymer and, correspondingly, from about 80% to about 20% by weight of a tackifying petroleum hydrocarbon resin having a softening point of from 0° C. to about 40° C., a number average molecular weight of from about 100 to about 600, and a Gardner color less than about 7 prepared by the aluminum chloride ctatlyzed Friedel Crafts polymerization of a hydrocarbon feed comprising:

(a) from about 5% to about 75% by weight of C_8 to C_{10}vinyl aromatic hydrocarbon stream;

(b) from about 10% to about 35% by weight of a piperylene concentrate; and

(c) from about 25% to about 70% by weight of a C_4 to C_8monoolefin chain transfer agent of the formula $RR'C{=}CHR''$ where R and R′ are C_1 to C_5 alkyl, and R″ is H or C_1 to C_4 alkyl group.

4,683,269

OPAQUE BINDER SYSTEM

Igor B. Aksman, Dover, Del., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Dec. 18, 1985, Ser. No. 810,422

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—258 **15 Claims**

1. A method for preparing an opaque polymeric binder system consisting essentially of:

(a) emulsion polymerizing about 5 to 95% by weight of at least one monomer not having an amine moiety, selected from the group consisting of vinyl, acrylic, methacrylic, and mixtures thereof, to produce homogeneous film forming polymeric particles having a T_g of less than about 45° C.;

(b) continuing the polymerization of step (a) in the presence of non-film forming hard, solid polymeric core particles having an average size of about 0.1 to 1 microns and a T_g greater than about 70° C., said polymeric core particles being previously formed from at least one monomer not having an amine moiety, different from, (a) selected from ethylenically unsaturated compounds, and gradually added to the polymerization of the homogenous film forming particles, in the presence of a mixture of nonionic and anionic surfactants having weight ratios of about 2:1 to 20:1 respectivley, wherein a portion of the homogeneous film forming material produced forms an encapsulating shell surrounding the core particles to produce a mixture of heterogeneous core-shell particles and said homogeneous film forming polymeric particles, and wherein the ratio of homogeneous film forming polymeric material to the polymeric material used to produce the core particles varies from about 1:9–9:1, respectively.

4,683,270

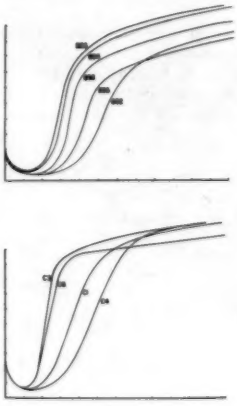
POLYMERIC COMPOSITION AND METHOD OF PRODUCING SAME

Gerald C. Hollaway, Jr., Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 693,950, Jan. 23, 1985, abandoned. This application Nov. 18, 1985, Ser. No. 798,789

Int. Cl.[4] C08C *19/20*

U.S. Cl. 525—347 **22 Claims**



1. In a polymeric composition comprising a chloroprene

elastomer, octylated diphenylamine, at least one metallic oxide selected from the group consisting of ZnO and MgO, at least one organic acid, carbon black, at least one accelerator and a retarder, the improvement wherein said retarder is dimorpholino-disulfide and said composition has increased scorch safety while maintaining high ODR torque, cured tensile modulus, and dynamic quotient.

4,683,271

SILICONE-ESTER POWDER COATING COMPOSITIONS

Ju-Chui Lin, Strongsville; Kirk J. Abbey, Seville; Gary P. Craun, Berea, and Peter V. Robinson, Medina, all of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 745,443, Jun. 17, 1985, Pat. No. 4,608,421. This application Jun. 2, 1986, Ser. No. 869,419

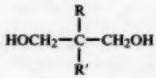
Int. Cl.[4] C08G *65/32*

U.S. Cl. 525—403 **7 Claims**

1. A siloxane ester having an acid number of from about 5 to 65, a hydroxyl number from about 5 to 225, and a tack-temperature of from about 150° F. to 220° F. comprising the reaction product, totaling 100% of:

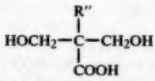
(a) 10 to 40 weight percent hindered glycol comprising a mixture of

(1) a sterically protected glycol selected from the group consisting of 1,4-cyclohexane dimethanol and a glycol having the structure



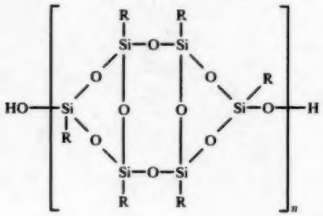
wherein R is selected from hydrogen, lower alkyl, mthylol or ethylol radicals; and R' is lower alkyl, methylol or ethylol radical; and

(2) a multifunctional glycol acid having the structure



wherein R'' is hydrogen, lower alkyl, methylol or carboxylic acid radicals; and wherein said glycol acid comprises 5–45 weight percent of said hindered glycol; and

(b) 60 to 90 weight percent hydroxy functional silicone having at least two ester precursor silanol groups adapted to react with said hindered glycol to provide a storage stable siloxane ester powder coating having a tack-temperature of at least 150° F., said siloxane having the structure:



wherein n is an integer from 1 to 10 and R independently represents lower alyl or phenyl groups.

4,683,272

POLYMER POLYOLS DERIVED FROM NOVEL DISPERSING MEDIA

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,155

Int. Cl.[4] C08G *65/32, 18/14, 18/67;* **C08L** *71/02*

U.S. Cl. 525—404 **15 Claims**

1. A vinyl polymer polyol prepared by the process comprising polymerizing via a free radical initiated reaction a monomer component comprising at least one monomer in the presence of a dispersing media comprising a polyether polyol and a salt formed by reacting a polyoxyalkylene polyamine with an acid containing a polymerizable double bond.

4,683,273

POLYESTER AND EPOXY RESIN COATING

Daniel Bode, Cleveland, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed May 27, 1986, Ser. No. 867,050

Int. Cl.[4] C08L *63/10*

U.S. Cl. 523—412 **8 Claims**

1. An aqueous coating composition containing a polymeric binder comprising on a weight basis:

between 65% and 90% of an epoxy-acrylic graft copolymer, between 7% and 25% of a low molecular weight, hydroxyl functional polyester polymer, and between 2% and 10% amine derivative crosslinking resin selected from an aminoplast or phenoplast resin wherein the combination equals 100%;

said polyester polymer being a substantially linear polyester polymer having a number average molecular weight between about 250 and 2,000 and hydroxyl number between about 115 and 285;

said epoxy-acrylic graft copolymer being selected from (a) an epoxy-acrylic carbon-carbon graft copolymer produced by copolymerizing ethylenically unsaturated monomers in the presence of epoxy resin and at least 3% by weight peroxide initiator based on monomers copolymerized to produce an in-situ formed carbon-carbon graft epoxy-acrylic copolymer, or (b) an epoxy-acrylic ester graft copolymer produced by esterifying a preformed acrylic copolymer containing carboxyl groups with epoxy resin in the presence of at least 2% by weight amine based on reactants to produce an ester graft epoxy-acrylic copolymer.

4,683,274

PROCESS FOR PRODUCING A WATER-ABSORBENT RESIN

Morio Nakamura, Kakogawa; Shigeji Obayashi, Akashi; Takushi Yamamoto, Himeji; Toshikazu Nakanishi, Kyoto; Hitoshi Tanaka, and Yuji Sakamoto, both of Himeji, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed May 28, 1985, Ser. No. 738,290

Claims priority, application Japan, Oct. 5, 1984, 59-210198

Int. Cl.[4] C08F *20/04, 2/32*

U.S. Cl. 526—216 **10 Claims**

1. A process for producing a water-absorbent resin wherein an aqueous solution of an α,β-unsaturated carboxylic acid and of an alkali metal salt thereof is subjected to polymerization with a radical polymerization initiator in a petroleum-based hydrocarbon solvent in the presence or absence of a crosslinking agent, characterized by using as a colloid agent, a saccharose-fatty acid ester having an HLB of 2 to 16 in an amount of 0.1 to 10% by weight based on the total of the α, β-unsaturated carboxylic acid and the alkali metal salt thereof, the fatty acid component of the saccharose-fatty acid ester being at least one member selected from the group consisting of stearic acid, palmitic acid, lauric acid and oleic acid and the number of esters per unit of saccharose being at least one selected from mono-, di-, and tri-.

4,683,275

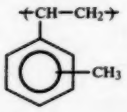
METHYLSTYRENE MALEIMIDE COPOLYMER

Masayuki Kato; Yoshio Taguchi, both of Saitama; Chihiro Imai, Kanagawa, all of Japan, and Tokuo Makishima, deceased, late of Saitama, Japan (by Nobuko Makishima, legal representative), assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,597
Claims priority, application Japan, Sep. 21, 1984, 59-196737
Int. Cl.[4] C08F 22/40
U.S. Cl. 526—262 13 Claims

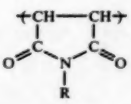
1. A methylstyrene copolymer consisting essentially of:

(A) 60 to 99 mol % of the structural unit represented by the following formula:



wherein at least 80 mol % the methyl groups are at the para position;

(B) 40 to 1 mol % of the structural unit represented by the following formula:



wherein R is a hydrogen atom, a C_1–C_6 alkyl group, or a C_6–C_{10} aryl group.

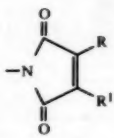
4,683,276

CYANATE FUNCTIONAL MALEIMIDE THERMOSETTING COMPOSITION

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 1, 1985, Ser. No. 782,644
Int. Cl.[4] C08F 22/40
U.S. Cl. 526—262 4 Claims

1. A composition comprising at least one thermosettable compound which contains simultaneously in the same molecule only one maleimide or substituted maleimide group which groups are represented by the formula



wherein each R and R^1 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; and only one cyanate group.

4,683,277

METHOD FOR PREPARING VINYL TERMINATED FLUORINE-CONTAINING POLYDIORGANOSILOXANE

Myron T. Maxson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 2, 1986, Ser. No. 881,304
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—21 3 Claims

1. A method for preparing a liquid polydiorganosiloxane of the average molecular formula $ViR''_2Si(OSiRR')_nOSiR''_2Vi$ where each R is individually a monovalent saturated or aromatic hydrocarbon radical containing from 1 to 20 carbon atoms, from 50 to 100% of the R' radicals represent the radical $RfCH_2CH_2$— where Rf in turn represents a perfluoroalkyl radical containing from 1 to 10 carbon atoms, any remaining R' radicals being selected from the same group as R, R'' is selected from the same group as R or R', Vi represents a vinyl radical, and n represents an integer from 10 to 200 and is equivalent to a viscosity value for said polydiorganosiloxane of from 0.2×10^{-3} to about 0.01 m^2/second at 25° C., said method comprising the steps of (1) reacting a cyclotrisiloxane of the general formula $(SiORR')_3$ with from 1.5 to about 50 mole percent, based on said cyclotrisiloxane, of water at a temperature of from 25° to 150° C. in a closed vessel and in the presence of an amount of ammonia sufficient to generate a pressure of from 140 to 1050 kilopascals within said vessel and continuing the reaction for a time period sufficient to form a silanol terminated polymer represented by the average formula $HO(RR'SiO)_nH$, (2) reacting each mole of said hydroxyl terminated polymer with at least one mole of a disilazane of the formula $(ViR''_2Si)_2NH$, at a temperature of from 50 to 100° C. for a sufficient time to form said polydiorganosiloxane, and (3) isolating said polydiorganosiloxane from the reaction mixture.

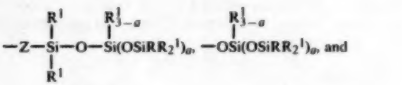
4,683,278

ALKENYL ORGANOPOLYSILOXANE AND CURABLE COMPOSITION THEREFROM

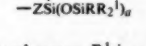
Toshio Suzuki, Ichihara, Japan, assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Division of Ser. No. 703,639, Feb. 21, 1985, Pat. No. 4,631,321.
This application Aug. 18, 1986, Ser. No. 897,488
Claims priority, application Japan, Feb. 28, 1984, 59-37112
Int. Cl.[4] C08G 77/20
U.S. Cl. 528—32 3 Claims

1. An organopolysiloxane comprising a polymer in which at least the molecular chain ends possess groups with a general formula selected from the group consisting of



and



wherein R is an alkenyl group, R^1 is a monovalent organic group selected from the group consisting of alkyl, alkenyl, alkoxy, aryl, and halogenated alkyl, Z is an alkylene group, and a is 2 or 3.

4,683,279

LOW MELTING URETHANE LINKED TOLUENEDIISOCYANATES

Barton Milligan, Coplay; William E. Starner, Freeland; Roland E. Grandin, Alburtis, and Jeremiah P. Casey, Emmaus, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 8, 1986, Ser. No. 882,994
Int. Cl.[4] C08G 18/76
U.S. Cl. 528—67 24 Claims

1. A process for producing a low melting urethane linked toluenediisocyanate which comprises the steps:

(a) reacting an isomer mix of 2,4- and 2,6-toluene diisocyanate with a short chain diol selected from the group consisting of dipropylene glycol, diethylene glycol 1,2-butanediol, 1,4-but-2-ene diol, triethylene glycol and tripropylene glycol;

(b) maintaining a temperature sufficient to effect reaction between a first isocyanate group of said toluenediisocya-

nate and a hydroxy group of said short chain diol, but insufficient for effecting reaction with a second isocyanate group on the toluenediisocyanate ring and a hydroxy group;

(c) maintaining a stoichiometric excess of toluenediisocyanate to said diol

(d) utilizing an isomer mix such that the reaction product contains from about 45 to 90% by weight of the 2,4-isomer and 10 to 55% of the 2,6-isomer; and (e) isolating the reaction product from the reaction medium.

4,683,280

RADIATION CURABLE COMPOSITION

Takashi Ukachi; Keiichi Bessho, both of Yokohama; Atsushi Kumano, Kawasaki; Yoshio Matsumura, Yamato, all of Japan, and Robert E. Ansel, Hoffman Estates, Ill., assignors to DeSoto, Inc., Des Plaines, Ill. and Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,974

Claims priority, application Japan, Mar. 30, 1985, 60-67998

Int. Cl.[4] C08G *18/38*

U.S. Cl. 528—71 **7 Claims**

1. A radiation curable polymer having a molecular weight of 2,000 to 100,000 and having:

(A) at least one structural unit selected from the structural units represented by the following general formulas (I), (II) and (III) on both ends of its molecule,

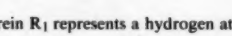
(B) at least one structural unit selected from the structural units represented by the following general formulas (IV), (V), (VI) and (VII),

(C) a structural unit represented by the following general formula (VIII),

(D) a structural unit represented by the following general formula (IX), and optionally

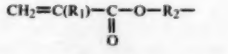
(E) at least one structural unit selected from the structural units represented by the following general formulas (X) and (XI),

wherein the structural units of the general formulas (I) to (XI) are linked by at least one linkage selected from urethane linkage, urea linkage, N-substituted urea linkage, amide linkage and ester linkage:



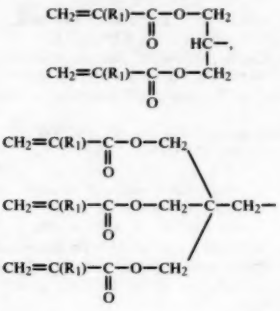
(I)

wherein R_1 represents a hydrogen atom or methyl group;



(II)

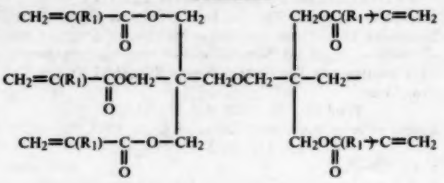
wherein R_1 is as defined in the general formula (I), and R_2 represents an alkylene group having 2 to 8 carbon atoms;



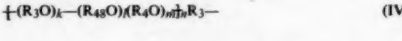
(III)

or

-continued

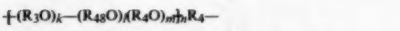


wherein R_1 is as defined in the general formula (I)

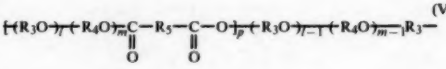


(IV)

or

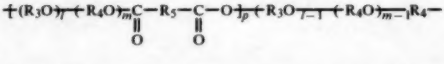


wherein R_3 and R_4, which may be identical or different, represent an alkylene group having 2 to 6 carbon atoms; R_{48} represents a divalent organic group with 13 to 18 carbon atoms having an aromatic group; k, l and m represent an integer of 0 to 50 but they are not 0 simultaneously; and n represents an integer of 0 to 50



(V)

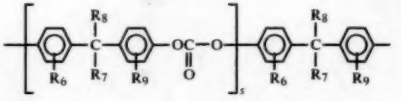
or



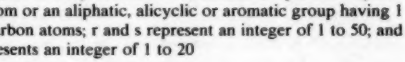
wherein R_3 and R_4 are as defined in the general formula (IV); R_5 represents an aliphatic, alicyclic or aromatic divalent group having 2 to 8 carbon atoms; l and m are as defined in the general formula (IV); and p represents an integer of 1 to 50

(VI)

or



wherein R_2 is as defined in the general formula (II); R_6, R_7, R_8 and R_9, which may be identical or different, represent a hydrogen atom or an aliphatic, alicyclic or aromatic group having 1 to 8 carbon atoms; r and s represent an integer of 1 to 50; and q represents an integer of 1 to 20

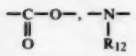


(VII)

wherein R_{10} represents an aliphatic, alicyclic or aromatic divalent group having 2 to 40 carbon atoms

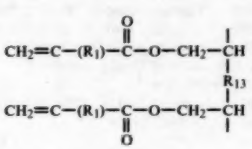
(VIII)

wherein R_{11} represents an aliphatic, alicyclic or aromatic trivalent group having 2 to 20 carbon atoms and optionally having, in its structure, —O—,



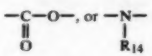
(wherein R_{12} represents a hydrogen atom or a substituted or unsubstituted aliphatic, alicyclic or aromatic group having 1 to 8 carbon atoms),

or $—SO_2—$; M represents a hydrogen atom, ammonia group, alkali metal atom or alkaline earth metal atom

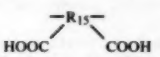


(IX)

wherein R_1 is as defined in the general formula (I); R_{13} represents a substituted or unsubstituted aliphatic, alicyclic or aromatic divalent group and optionally having, in its structure —O—,

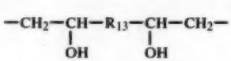


(wherein R_{14} represents a hydrogen atom or a substituted or unsubstituted aliphatic, alicyclic or aromatic group having 1 to 8 carbon atoms)



(X)

wherein R_{15} represents an aliphatic, alicyclic or aromatic tetravalent group having 2 to 20 carbon atoms



(XI)

wherein R_{13} is as defined in general formula (IX).

4,683,281

ORGANOPHOSPHITE ACCELERATORS FOR EPOXIDE CURING

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,058
Int. Cl.[4] C08G *59/50, 59/68*
U.S. Cl. 528—89 **10 Claims**

1. A curable epoxide composition comprising an epoxide resin, a triaryl phosphite accelerator and a poly(alkylene oxide)polyamine or an amino alkyl piperazine epoxide resin hardener.

4,683,282

NOVEL BORON TRIFLUORIDE-POLY (ALKYLENE OXIDE) AMINE CATALYSTS FOR CURING EPOXY RESINS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 21, 1986, Ser. No. 899,120
Int. Cl.[4] C08G *59/72*
U.S. Cl. 528—91 **12 Claims**

1. A process for curing epoxide resins comprising mixing of epoxide resin with a boron trifluoride-amine complex catalyst wherein the amine moiety of said catalyst is a poly(alkylene oxide) polyamine and heating the resulting mixture at a temperature in the range of from about 100° to 200° C.

4,683,283

LATENT ACCELERATORS FOR EPOXIDE CURING

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,057
Int. Cl.[4] C08G *59/68*
U.S. Cl. 528—93 **12 Claims**

1. A heat curable epoxide composition comprising an epoxide resin, a phenol carbamate accelerator and an amine hardener.

4,683,284

OXIME CARBAMATE ACCELERATORS FOR CURING POLYEPOXIDES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 23, 1986, Ser. No. 877,622
Int. Cl.[4] C08G *59/68, 59/56*
U.S. Cl. 528—93 **18 Claims**

1. The adhesive composition comprising a mixture of
(A) An epoxy resin and an oxime carbamate and
(B) An amine hardener containing primary, secondary or tertiary amino or amido-amine groups.

4,683,285

PIGMENT GRINDING VEHICLES FOR USE IN WATER-DILUTABLE PAINTS

Willibald Paar, and Helmut Hönig, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 22, 1985, Ser. No. 790,185
Claims priority, application Austria, Oct. 22, 1984, 3358/85
Int. Cl.[4] C08G *65/26;* C08L *63/00;* C25D *9/00*
U.S. Cl. 528—113 **33 Claims**

1. Cationic binders water-soluble upon at least partial neutralization of basic groups contained therein comprising the reaction product of components (A) and (B), said component (A) being free of epoxide groups and prepared from a polyepoxide having a maximum molecular weight of 2000 and an amine containing a primary alkylamino group, said amine being present in an amount to provide from about 0.4 to 1.0 moles of primary amine groups for each mole of epoxide groups in said polyepoxide, and said component (B) being a carbonyl compound which is a member of the group consisting of aliphatic and aromatic aldehydes or ketones; said reaction product containing an oxazolidine ring formed through reaction of component (B) with component (A) and having a molecular weight of from about 500 to 4000, an oxazolidine equivalent of from about 250 to 1200, an amine value of at least 80 mg KOH/g and a proportion of aliphatic molecule segments of at least 30%.

14. A pigment paste comprising as a grinding vehicle the binder of claim **1**.

18. A method of replenishing cathodically depositable paint material in a two-component replenishing process wherein the pigment component is the pigment paste of claim **14**.

4,683,286
POLYACRYLONITRILES WITH A LOW K VALUE, A PROCESS FOR THEIR PREPARATION AND THEIR SUITABLE USE

Tibor Krakkay, Munich; Tatjana Poggi, Saal, and Ernst Schubert, Kelheim/Donau, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 636,965, Aug. 2, 1984, abandoned. This application Feb. 21, 1986, Ser. No. 832,453

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328276

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—329.1 **2 Claims**

1. A hydrolyzed polyacrylonitrile made by hydrolysis, involving heating a homopolymer or copolymer of an acrylonitrile containing at least 60% by weight of acrylonitrile units and up to 40% by weight of units copolymerisable with acrylonitrile having a K-value according to Fikentscher of 34 to 15 and a content of 180 to 900 milliequivalents sulfonate end groups which do not originate from comonomers containing sulfonate groups,

in an alkaline aqueous solution sufficient to form a hydrolysate of said polyacrylonitrile showing the following properties:

a K-value equal to said K-value according to Fikentscher in the range of 34 to 15,

sulfonic acid groups in a content in the range of 100 to 500 milliequivalents/Kg of the hydrolysate (as the Na salt) corresponding to a sulfur content of 0.3 to 1.5% by weight/kg of hydrolysate (as the Na salt).

acrylic acid units in a content (calculated as Na acrylate in the hydrolyzed product in the Na salt form) of 50 to 85% by weight.

strongly acidic groups other than sulfonic acid groups in a content of 200 to 1,500 milliequivalents/kg of hydrolyzed product (as the Na salt) and

said product having a residual nitrogen content of about 0.3 to 5% by weight, relative to the quantity of hydrolyzed product in the Na salt form.

4,683,287
COMPOSITIONS CONTAINING A REACTIVE MONOMER DERIVED FROM A LACTONE

Joseph V. Koleske, Charleston, W. Va., and Linda A. Domeier, Somerville, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 755,532, Jul. 16, 1985, abandoned, which is a continuation of Ser. No. 565,530, Dec. 29, 1983, abandoned, which is a continuation of Ser. No. 438,496, Nov. 2, 1982, abandoned. This application Aug. 14, 1986, Ser. No. 895,594

Int. Cl.[4] C08G *63/10*

U.S. Cl. 528—357 **19 Claims**

1. A substantially liquid composition comprising:

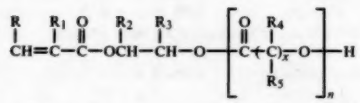
(a) 1 to 10 weight percent of a lactone,

(b) greater than 1 to about 20 weight percent of hydroxyalkyl acrylate or methacrylate,

(c) 2 or less weight percent of diacrylates,

(d) 10 or less weight percent of products resulting from Michael addition, acrylic polymerization, transesterification reactions, or other side reactions,

(e) remainder to 100 weight percent of a reactive monomer of the following formula:



wherein R, R_1, R_2, and R_3 are independently hydrogen or methyl, R_4 and R_5 are independently hydrogen or alkyl of from 1 to 12 carbon atoms, x is from 4 to 7, and the average value of n in the composition is 1 to 3, and

(f) less than about 100 parts per million of catalyst, based on the total weight of the composition.

6. A process for preparing the composition of claim 1 which comprises reacting, in an atmosphere that contains oxygen, a lactone and hydroxyalkyl acrylate or methacrylate in the presence of less than about 100 parts per million of a catalyst, based on the combined weight of lactone and hydroxyalkyl acrylate or methacrylate, and less than 1000 parts per million of an inhibitor to prevent polymerization of the hydroxyalkyl acrylate or methacrylate at a temperature of from about 100° to about 140° C.

4,683,288
POLYMER AND ITS PRODUCTION

Motoaki Tanaka, Saitama; Yasuaki Ogawa, Osaka; Tsutomu Miyagawa, and Toshio Watanabe, both of Saitama, all of Japan, assignors to Waco Pure Chemical Ind. Inc. and Takeda Chemical Industries, Ltd., both of Osaka, Japan

Filed Jul. 3, 1985, Ser. No. 751,671

Claims priority, application Japan, Jul. 6, 1984, 59-140356

Int. Cl.[4] C08G *63/04*

U.S. Cl. 528—361 **13 Claims**

1. In a method for producing a polymer or copolymer of lactic acid and/or glycolic acid by subjecting lactic acid and/or glycolic acid to a polycondensation reaction, an improvement which comprises employing a solid inorganic acid catalyst as a polycondensation catalyst, wherein the solid inorganic acid catalyst is one selected from the group consisting of acid clay, activated clay, bentonite, kaolin, talc, aluminum silicate, magnesium silicate, alumina bolia and silicic acid.

4,683,289
NOVEL FLUORINE-CONTAINING POLYAMINOAMIDE AND PREPARATION THEREOF FROM FLUOROOXETANE AND POLYAMINE

Yohnosuke Ohsaka, Ibaraki; Yoshio Amimoto, Takatsuki, and Yoshio Negishi, Settsu, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

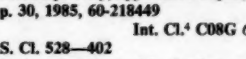
Filed Oct. 11, 1985, Ser. No. 786,682

Claims priority, application Japan, Oct. 22, 1984, 59-222466; Sep. 30, 1985, 60-218449

Int. Cl.[4] C08G *69/42*

U.S. Cl. 528—402 **16 Claims**

1. A polyaminoamide, having recurring units, of the formula:



(I)

wherein R and R′ are the same or different and represent a hydrogen atom or a monovalent organic group and A is a divalent organic group; or where R and R′ are bound together to form a cyclic group together with A and the nitrogen atom to which they are bonded and n is a positive integer greater than zero.

4,683,290
METHOD FOR TREATING THERMOPLASTIC POLYMERS

Richard J. Bennett, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 26, 1985, Ser. No. 813,348

Int. Cl.[4] B32B *5/16*

U.S. Cl. 528—480 **13 Claims**

1. A method for devolatilizing a normally-solid thermoplastic polymer containing volatile material, comprising:

(a) forming a body of molten, normally-solid, high density heat exchange material, having a density substantially

above the density of said thermoplastic polymer and which is essentially immiscible with said thermoplastic polymer, in a contact zone, in a manner to maintain an extended surface area body of said heat exchange material, by heating said body of heat exchange material to a temperature above the melting point thereof and above the volatilization temperature of said volatile material;

(b) introducing said thermoplastic polymer containing said volatile material, in a liquid form, through a distributor means disposed in said body of heat exchange material, in a manner to form a layer of said thermoplastic polymer on the surface of said body of heat exchange material, whereby said volatile material is vaporized and said thermoplastic polymer is devolatilized; and

(c) withdrawing the thus devolatilized thermoplastic polymer from said body of heat exchange material, to form a continuously flowing layer of said thermoplastic material on said surface of said exchange material.

4,683,291

PLATELET BINDING INHIBITORS

Theodore S. Zimmerman; Zaverio M. Ruggeri, both of La Jolla, and Richard Houghten, Solhna Beach, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Oct. 28, 1985, Ser. No. 791,872

Int. Cl.[4] A61K *37/02;* **C07C** *103/52*

U.S. Cl. 530—324 **33 Claims**

1. A peptide having one of the formulas

$$H_2N-(Ch)-Arg-Gly-Asp-(Cx)-H \quad (1a)$$

$$[NH-(Cx)-Asp-Gly-Arg-NH_2]_n \quad (1b)$$

$$[H_2N-(Ch)-NH]_m-(CZ)-C(O)-Arg-Gly-Asp-(Cx)-H$$

$$[H_2N-(Ch)-NH]_m-(CZ)- \quad (1c)$$

$$-[C(O)-Arg-Gly-Asp-(Cx)-H)]_n$$

$$[H_2N-(Ch)-NH]_m-(CZ)- \quad (1d)$$

$$-[NH-(Cx)-Asp-Gly-Arg-NH_2]_n$$

wherein:

(Ch) is a chain of 1 to 20 amino acid residues which contains at least 1 residue selected from the group consisting of Lys and Arg;

m and n are each 1–10, and (m+n) is 3–20;

(CZ) is a straight or branched alkyl group contained at least (m+n) carbon atoms and up to 20 carbon atoms;

(Cx) is a chain of 1 to 20 amino acid residues or a chemical bond with the proviso that (Cx) in formula (1a) does not include the amino acid residues, Cys, Thr or Ser; and each amino acid residue is in the (L) or (D) configuration.

4,683,292

IMMUNOTHERAPEUTIC POLYPEPTIDE AGENTS WHICH BIND TO LYMPHOCYTE IMMUNOGLOBULIN FC RECEPTORS

Gary S. Hahn, San Diego, Calif., assignor to Immunetech, Inc., San Diego, Calif.

Filed Aug. 12, 1983, Ser. No. 522,602

Int. Cl.[4] C07K *7/06*

U.S. Cl. 530—328 **1 Claim**

1. A peptide haveing an amino acid sequence

Arg-Ser-Thr-Thr-Lys-Thr-Ser-Gly-Pro-Arg

composed of L-enantiomeric amino acid residues and pharmaceutically acceptable salts thereof.

4,683,293

PURIFICATION OF PICHIA PRODUCED LIPOPHILIC PROTEINS

William S. Craig, San Diego, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 20, 1986, Ser. No. 920,385

Int. Cl.[4] C07K *3/02, 15/04*

U.S. Cl. 530—359 **9 Claims**

1. A method for the extraction of lipophilic proteins from host cells of the genus Pichia which comprises

(a) subjecting the cells to cell breaking conditions for a time sufficient to cause breakage of substantially all of the cells, wherein said breakage is carried out in the presence of an extraction medium comprising

in the range of about 1 up to 8 molar concentration of at least one chaotropic salt, in a medium buffered at a pH suitable to maintain said lipophilic protein in a stable form, and

(b) recovering the soluble fraction obtained from step (a).

4,683,294

PROCESS FOR THE EXTRACTION AND PURIFICATION OF PROTEINS FROM CULTURE MEDIA PRODUCING THEM

Frans Van Wijnendaele, Ottenburg; Daniel Gilles, Genval, and Guy Simonet, Perwez, all of Belgium, assignors to Smith Kline RIT, S.A., Belgium

Filed Apr. 3, 1985, Ser. No. 719,601

Int. Cl.[4] A61K *39/12*

U.S. Cl. 530—371 **18 Claims**

1. In a method for extracting and purifying a cell-bound protein from the supernatant of engineered yeast cells having produced such protein and disrupted in the presence of a non-ionic detergent, a process which comprises, as a first step, adjusting the pH of the supernatant to 6 (±0.1), adding thereto either liquid or solid polyethylene glycol up to clarification of said supernatant, and, as a second step, treating the clarified supernatant either with a bivalent metal cation or, before ultrafiltration or after eventual ultrafiltration, with ammonium sulfate for separating said protein.

4,683,295

METHOD FOR THE PREPARATION OF ANTI-RECEPTOR ANTIBODIES

Dennis A. Carson, Del Mar, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 24, 1984, Ser. No. 614,102

Int. Cl.[4] C07K *3/08*

U.S. Cl. 530—391 **17 Claims**

1. A method of preparing an anti-receptor internal image antibody comprising:

(a) administering to a first animal host a receptor-containing composition in an amount sufficient to induce the production of an anti-receptor antiserum containing anti-receptor antibodies;

(b) recovering said anti-receptor antibodies from the anti-receptor antiserum of the first animal host in partially purified form;

(c) adminstering to a second animal host of the same species as the first animal host a ligand in an amount sufficient to induce the production of anti-ligand antiserum containig anti-ligand antibody, said ligand binding to said receptor;

(d) recovering the anti-ligand antibody from the anti-ligand antiserum of the second animal host;

(e) combining the anti-receptor antibody and the anti-ligand antibody to form a first admixture containing a first complex;

(f) separating the first complex from the first admixture;

(g) decomplexing the first complex; and

(h) isolating substantially pure internal image anti-receptor antibody.

4,683,296

CARBAPENEM INTERMEDIATES

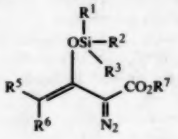
Yasutsugu Ueda, Manlius, N.Y., and Guy Roberge, St. Lambert, Canada, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 472,443, Mar. 7, 1983. This application Apr. 22, 1985, Ser. No. 725,594

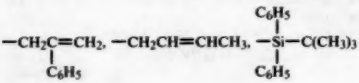
Int. Cl.[4] C07C *113/00*

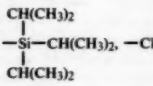
U.S. Cl. 539—558 **3 Claims**

1. A process for the preparation of a compound of the formula

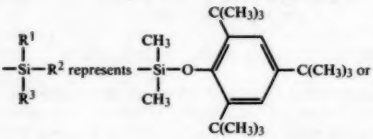


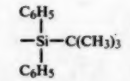
wherein R^5 and R^6 are each independently hydrogen or methyl, R^7 is an ester group selected from C_1–C_4 alkyl, p-nitrobenzyl, $-CH_2CH{=}CH_2$, $-CH_2CH{=}CHC_6H_5$, $-CH_2CH{=}CHCO_2CH_3$,



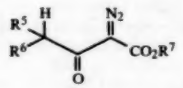


and R^1, R^2 and R^3 are each independently C_1–C_4 alkyl or, alternatively,



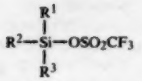


which process comprises reacting a compound of the formula



IV

wherein R^5, R^6, and R^7 are as defined above with a silyl triflate of the formula



V

wherein R^1, R^2, and R^3 are as defined above in an inert solvent and in the presence of an organic base.

4,683,297

PROCESS FOR THE PREPARATION OF GLYCOSIDES

Tetsuji Yanami; Yoshiyuji Murai, both of Himeji, and Ryoichi Oshima, Tokyo, all of Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Continuation of Ser. No. 617,353, Jun. 5, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,669

Claims priority, application Japan, Jun. 7, 1983, 58-100254; Jun. 10, 1983, 58-102711

Int. Cl.[4] C07H *1/00*

U.S. Cl. 536—18.6 **16 Claims**

1. A process for the preparation of glycosides which comprises reacting a monosaccharide or a polysaccharide with a monohydric alcohol or a polyhydric alcohol in the presence of a perfluorosulfonic acid at a temperature from above the boiling point of the alcohol to not more than 230° C.

4,683,298

PROCESS FOR THE PREPARATION OF AMINATED POLYSACCHARIDE DERIVATIVES

Manssur Yalpani, Montreal, Canada, assignor to British Columbia Research Council, Vancouver, Canada

Continuation-in-part of Ser. No. 690,664, Jan. 10, 1985, abandoned. This application Feb. 21, 1986, Ser. No. 832,462

Int. Cl.[4] C08B *31/00, 31/08, 37/00, 37/02*

U.S. Cl. 536—45 **24 Claims**

1. A process for preparing an amino deoxy derivative of starch, the process comprising:

(a) oxidizing the starch with dimethyl sulfoxide in combination with a reagent selected from (i) acetic anhydride and (ii) acetic anhydride with paraformaldehyde; and

(b) subjecting the product from (a) to reductive amination.

4,683,299

SUGAR ESTERS AND AN IMPROVED ANHYDROUS METHOD OF MANUFACTURE

Sandra Kea; Charles E. Walker, both of Lincoln, Nebr., and Eric Kline, Austin, Tex., assignors to Nebraska Department of Economic Development, Lincoln, Nebr.

Filed Aug. 10, 1984, Ser. No. 639,784

Int. Cl.[4] C07H *1/00*

U.S. Cl. 536—119 **21 Claims**

1. A method for synthesizing sugar esters which comprises the steps of:

(a) dissolving an edible sugar in a subsantially anhydrous organic acid solvent;

(b) adding to said solvent and said dissolved edible sugar an organic acid chloride having at least two carbon atoms to form a substantially anhydrous liquid mixture containing at least about 0.1 mole of organic acid chloride for each mole of monosaccharide moiety of sugar;

(c) mixing said sugar and organic acid chloride to cause an esterification reaction;

(d) maintaining a substantially anhydrous condition throughout the reaction; and

(e) recovering the sugar ester thereby produced.

4,683,300

DEADCAT REACTION FOR MAKING 9-DEOXY-9-ISOCYANATO CLAVULANATES

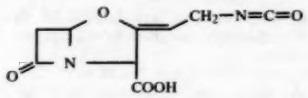
John B. Harbridge, Redhill, England, assignor to Beecham Group, p.l.c., United Kingdom

Division of Ser. No. 530,752, Sep. 9, 1983, Pat. No. 4,622,177. This application Sep. 30, 1985, Ser. No. 781,503

Int. Cl.[4] C07D *498/04;* C07B *43/10*

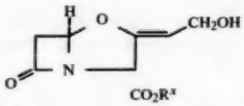
U.S. Cl. 540—348 **1 Claim**

1. A process for preparing a compound of formula (I):



(I)

or a salt of carboxylic acid or ester thereof, which process comprises reacting a compound of formula (II):



(II)

wherein R^x is a carboxy-protecting group with

(i) isocyanic acid;

(ii) a compound of formula (III):

$$R^1OCON=NCOOR^2 \quad \text{(III)}$$

wherein R^1 and R^2 are each independently C_{1-6} alkyl, aryl or aryl (C_{1-6}) alkyl; and

(iii) a compound of formula (IV):

(IV)

wherein l, m and n are each independently 0 or 1, and R^3, R^4 and R^5 are each independently C_{1-6} alkyl, aryl or aryl (C_{1-6}) alkyl;

and thereafter, where necessary, carrying out one or more of the following steps:

(a) removing the carboxy-protecting group R^x; and/or

(b) converting a salt to the free carboxylic acid of formula (I) or to an ester, or to a different salt.

4,683,301

CARBAPENEM ANTIBIOTICS

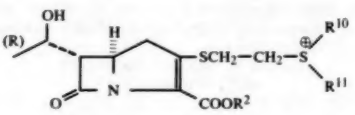
Choung U. Kim, Manlius, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 366,627, Apr. 8, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,838

Int. Cl.[4] C07D *487/04;* A61K *31/40*

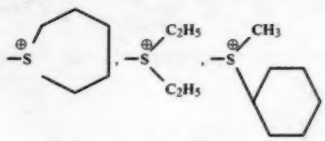
U.S. Cl. 540—350 **8 Claims**

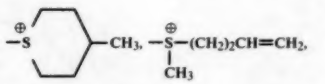
1. A compound of the formula

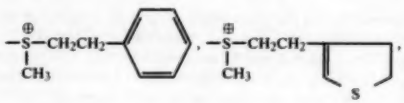


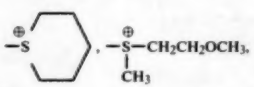
wherein R^2 is hydrogen, an anionic charge or a conventional readily removable carboxyl protecting group; and

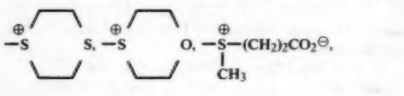
represents

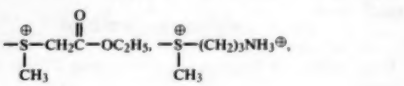


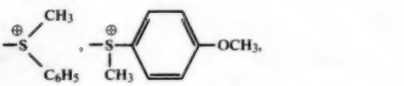


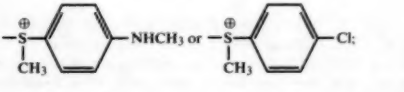












or a pharmaceutically acceptable salt thereof.

4,683,302

AZETIDINEDIONE COMPOUNDS AS CROSSLINKERS FOR ELECTRODEPOSITED COATINGS

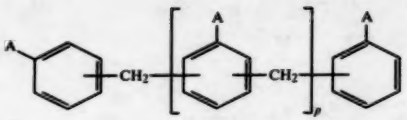
Shenghong A. Dai, Wallingford, and Philip W. Sherwood, Milford, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 660,768, Oct. 15, 1984, Pat. No. 4,576,980. This application Dec. 20, 1985, Ser. No. 811,853

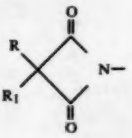
Int. Cl.[4] C07D *403/14, 403/10*

U.S. Cl. 540—356 **5 Claims**

1. A polymethylene poly(phenyl azetidinedione) having the formula



wherein A represents an azetidinedione group having the formula



wherein R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R_1 are taken together with the carbon atom to which they are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, and p represents an integer from 1 to 8, inclusive, or in the case of a mixture p has a mean value greater than 0 but less than 1.

4,683,303

REDUCTION PROCESS FOR THE PREPARATION OF 4-UNSUBSTITUTED AZETIDIN-2-ONES

Hans R. Pfaendler, Pippinplatz 1, D-8000 Munich 71, Fed. Rep. of Germany

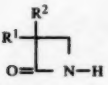
Filed Oct. 30, 1984, Ser. No. 666,443

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3340006

Int. Cl.[4] C07D *205/08*; C07B *41/08*

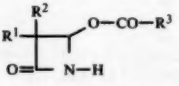
U.S. Cl. 540—362 **10 Claims**

1. A process for the preparation of azetidin-2-ones of the formula I:



(I)

in which (i) R^1 and R^2 independent from each other are hydrogen, an alkyl group with 1 to 7 carbon atoms or an alkoxy group with 1 to 7 carbon atoms, or (ii) in which R^1 is an amino group or a protected amino group, and R^2 is hydrogen, an alkyl group with 1 to 7 carbon atoms or an alkoxy group with 1 to 7 atoms, provided that R^1 and R^2 cannot be an organic group linked via a carbonyl group to the ring carbon atom when one of the groups R^1 or R^2 is hydrogen, and characterized in that a 4-acyloxy-azetidin-2-one of the formula II:



(II)

wherein R^1 and R^2 are as defined above and R^3 is selected from the group consisting of hydrogen and aliphatic, aromatic or arylaliphatic hydrocarbon radicals with up to 18 carbon atoms stable at the reaction conditions, is reacted with a complex hydride containing reactive hydride ions and of the formula:

$$A^o[XY_mH_n]_o$$

wherein A is selected from the group consisting of Li, K, Na, Ca, Mg, Zn and $(R^4)_4N$, in which R^4 is a lower alkyl group;

X=B or Al;

Y=H, an alkyl or alkoxy group with 1–7 carbon atoms, or a cyano group;

m=1.3, n=1–3, and m+n=4; and

o=valence of A.

4,683,304

PROCESS FOR PREPARING AN ACYL-LACTAM COMPOUND

Albert A. Van Geenen, Brunssum, and Jozef J. M. Bongers, Elsloo, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 13, 1985, Ser. No. 808,560

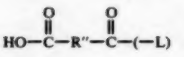
Claims priority, application Netherlands, Dec. 20, 1984, 8403862

Int. Cl.[4] C07D *223/10, 211/40, 209/34*

U.S. Cl. 540—529 **5 Claims**

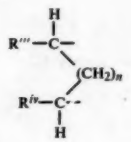
1. Process for preparing an acyl-lactam compound comprising:

reacting the reaction product of a lactam with a dicarboxylic acid anhydride, said reaction product having the formula



wherein

R" is a bivalent radical having the following formula



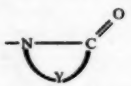
wherein

R"' is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl,

R^{iv} is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl where R"' and R^{iv} may jointly form a substituted or non-substituted cycloalkyl residue

n is 0 or 1

(-L) represents a non-opened lactam ring of the formula



wherein Y has 3–11 carbon atoms with

a polyol having an equivalent weight of at least 300 up to 3,000 at a temperature of at most 150° C.

4,683,305

OBTAINING CAPROLACTAM BY CLEAVING OLIGOMERS OF CAPROLACTAM

Hugo Fuchs, Ludwigshafen; Uwe Brand, Lampertheim, and Helmut Buchaeckert, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,177

Int. Cl.[4] C07D *201/12*

U.S. Cl. 540—533 **4 Claims**

1. A process for obtaining caprolactam by cleaving oligomers of caprolactam, wherein the oligomers, in a liquid or solid state, are introduced into a fluidized alumina bed and cleaved

at from 290° to 400° C. in the presence of steam, and, in addition to the amount of inert gas required to fluidize the alumina bed, from 0.1 to 3 times this amount of inert gas is introduced above the fluidized bed.

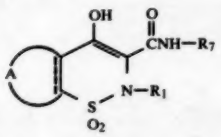
4,683,306

PROCESS FOR THE PREPARATION OF 3,4-DIHYDRO-2-SUBSTITUTED-2H-1,2-THIAZINE-CARBOXYLIC ACID 1,1-DIOXIDE DERIVATIVES

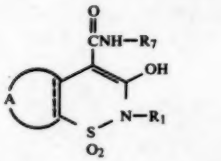
Jung J. Suh, and You H. Hong, both of Seoul, Rep. of Korea, assignors to YuHan Corporation Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 13, 1984, Ser. No. 630,393
Int. Cl.[4] C07D *279/02, 513/04*
U.S. Cl. 544—33 4 Claims

1. A process for the preparation of a partially hydrolyzed compound of formula (V) or (VI), respectively:

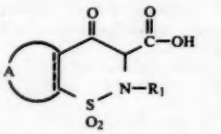


(V)

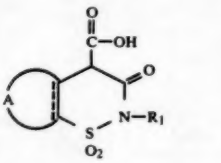


(VI)

which comprises reacting a compound of the formula I or II:

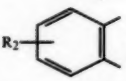


(I)

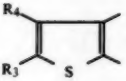


(II)

with at least a 2 molar amount of the acylating agent R_9—X and with R_7—NH_2 wherein A together with the two carbon atoms to which it is attached forms one of the groups (a)–(e):

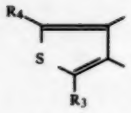


(a)

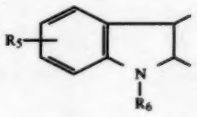


(b)

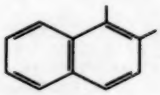
-continued



(c)

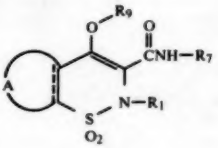


(d)

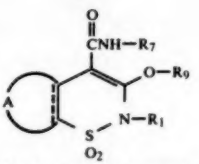


(e)

and the broken line represents the double bond in (a), (b), (d) and (e); R_1 is lower alkyl having from 1 to 3 carbon atoms; R_2 is hydrogen, halogen, nitro, trifluoromethyl, lower alkyl having from 1 to 5 carbon atoms, lower alkoxy have from 1 to 5 carbon atoms in the alkyl moiety, phenyl, or phenyl lower alkyl having from 1 to 3 carbon atoms in the alkyl moiety; R_3 and R_4 each is a hydrogen atom or a lower alkyl group; R_5 is hydrogen, fluorine, chlorine, bromine, methoxy, methyl, ethyl or trifluoromethyl; and R_6 is methyl or ethyl; R_7 is hydrogen, lower alkyl having from 1 to 3 carbon atoms, lower alkoxy having from 1 to 3 carbon atoms in the alkyl moiety thereof, phenyl which may be substituted by halogen, hydroxyl, lower alkyl trifluoromethyl, or lower alkoxy or phenylalkyl having from 1 to 3 arbon atoms in the alkyl moiety; and R_9 is trialkylacetyl having from 1 to 3 carbon atoms in the alkyl moiety, benzenesulfonyl or substituted benzenesulfonyl in which the substituent is methyl, and X is halogen, to form an N-substituted-4(or 3)-substituted-2-substituted 2H-1,2-thiazine-3(or 4)carboxamide 1,1-dioxide derivative of the formula (X) or (XI):

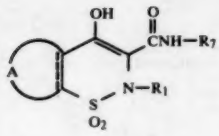


(X)

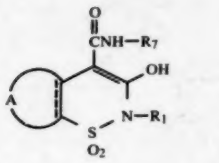


(XI)

wherein the reaction temperature range is from −5° C. to ambient temperature, the total reaction time is 5 hours and in which R_9—X and R_7NH_2 are simultaneously present, and further comprises partially hydrolyzing a compound of said formula (X) or (XI) in the presence of alkali and neutralizing the resulting compound with a mineral acid to give a compound of formula (V) or (VI), respectively:



(V)



(VI)

4,683,307

PROCESS FOR THE PREPARATION OF DODECAMETHYLENEBISMELAMINE

Peter Werle, Gelnhausen; Holger Focke, Bruchkoebel, and Alwin Boes, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 27, 1986, Ser. No. 833,693

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509056

Int. Cl.[4] **C07D** *251/70*

U.S. Cl. 544—198 **8 Claims**

1. A process for the preparation of dodecamethylenebismelamine comprising reacting 2,4-diamino-6-chloro-1,3,5-triazine with 1,12-diaminododecane as reactants in an alkaline, aqueous suspension, said 1,12-diaminododecane having been dissolved in a watermiscible, organic solvent and then added to said suspension, carrying out the reaction at reflux temperature cooling the formed reaction mixture to room temperature, and separating the resulting crystallized product.

4,683,308

PROCESS FOR THE PREPARATION OF 2-ARYLAMINO-4,6-DICHLORO-S-TRIAZINES

Andreas Günther, Cologne; James R. Malone, Dormagen; Manfred Lenthe, Odenthal, and Hans-Walter Höhl, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

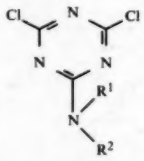
Filed Jan. 21, 1986, Ser. No. 820,510

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504073

Int. Cl.[4] **C07D** *251/44*

U.S. Cl. 544—211 **8 Claims**

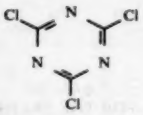
1. In the preparation of a 2-arylamino-4,6-dichloro-s-triazine of the formula



in which

R^1 is, a carbocyclic aryl radical which is optionally substituted by alkyl with 1 to 6 carbon atoms, nitro, cyano, alkoxy with 1 to 5 carbon atoms, halogen and/or halogenoalkyl with 1 to 5 carbon atoms and 1 to 5 halogen atoms, and

R^2 is hydrogen or alkyl, by reacting cyanuric chloride of the formula



with a virtually water-insoluble arylamine of the formula

at a temperature between 0° and 100° C., the improvement which comprises effecting the reaction in water at an acid pH in the presence of a virtually water-insoluble organic solvent.

4,683,309

PHENYLQUINOXALINE RESIN MONOMERS

Marilyn R. Unroe, Dayton; Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1986, Ser. No. 819,334

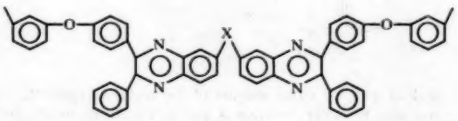
Int. Cl.[4] **C07D** *241/42;* **C08F** *26/06*

U.S. Cl. 544—353 **5 Claims**

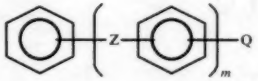
1. A phenylquinoxaline compound having the formula

Ar—C≡C—Pq—C≡C—Ar

wherein Pq has the formula



wherein X is a single bond, —O—, —S—, —SO_2—; —CH_2—, —CO—, —OC_6H_4O—, —OC_6H_4—C_6H_4O—, —$OC_{10}H_6O$— or —$OC_6H_4SO_2C_6H_4O$—; and wherein Ar is



wherein m is an integer having a value of 1 or 2, Z is —O— or —S—, and Q is —H, —ZC_6H_5 or —$SO_2C_6H_5$.

4,683,310
PYRIDINE DICARBOXYLIC ESTER METAL EXTRACTANTS

Raymond F. Dalton, Cheshire; Raymond Price, Huddersfield; Peter M. Quan, Lancashire, and David Stewart, Oldham, all of England, assignors to Imperial Chemical Industries, PLC, England

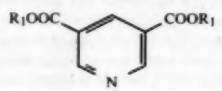
Division of Ser. No. 418,833, Sep. 16, 1982, Pat. No. 4,525,330, which is a continuation-in-part of Ser. No. 341,176, Jan. 20, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 702,579

Claims priority, application United Kingdom, Feb. 3, 1981, 8103223; Aug. 26, 1981, 8126079

Int. Cl.[4] C07D *213/80*

U.S. Cl. 546—321 **8 Claims**

1. A substituted pyridine which has the formula:



wherein R_1 is a hydrocarbyl group containing from 5 to 36 carbon atoms, the two groups R_1 may be the same or different and the two groups R_1 together contain a total of from 16 to 36 carbon atoms.

4,683,311
SPIRO[ISOXAZALIDINE-3,2'-TRICYCLO[3.3.1.1^{3,7}] DECANES]

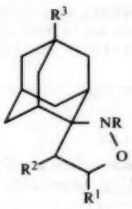
Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 22, 1986, Ser. No. 821,292

Int. Cl.[4] C07D *261/02*

U.S. Cl. 548—240 **20 Claims**

1. A spiro [isoxazolidine -3,2'-tricyclo[3.3.1.1.^{3,7}]decane]-compound having the structural formula



wherein R is a C_1–C_4 alkyl group; R^1 is a substituent selected from the group consisting of C_1–C_{24} primary alkyl, an amino C_1–C_4 alkyl, a carboxyl, a phenyl, a C_1–C_4 alkoxy carbonyl, a (trifluoroacetamido)C_1–C_4 alkyl, a hydroxy C_1–C_4 alkyl, an aminocarbonyl, a (C_1–C_4 alkylamino) carbonyl, an [(aminocarbonyl)amino]C_1–C_4 alkyl, a [[(C_1–C_4 alkylamino)carbonyl-]amino]C_1–C_4 alkyl, a [[(phenylamino)thiocarbonyl]amino]C-$_1$–C_4 alkyl, a (C_1–C_{24} alkanoyloxy)C_1–C_4 alkyl and a (C_1–C_{24} alkanoylamino) C_1–C_4 alkyl; R^2 is hydrogen or a C_1–C_4 alkoxycarbonyl; and R^3 is hydrogen or hydroxy, and the hydrochloride salt of said compound.

4,683,312
IMIDAZOLIUM HYPOGLYCEMIC AGENTS

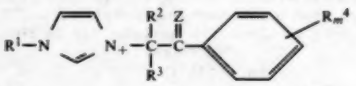
Samuel J. Dominianni, and Terence T. Yen, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 670,776, Nov. 13, 1984, Pat. No. 4,609,670. This application May 27, 1986, Ser. No. 866,664

Int. Cl.[4] C07D *233/60*

U.S. Cl. 548—341 **4 Claims**

1. A compound of the formula



II

X^-

wherein:

R^1 is C_1–C_4 alkyl;

R^2 and R^3 independently are hydrogen or C_1–C_4 alkyl;

each R^4 independently is —OR^5, —NR^6R^7, C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_4 alkylthio;

R^5 is hydrogen or

R^6 is hydrogen, C_1–C_4 alkyl or

R^7 is hydrogen or C_1–C_4 alkyl;

each R^8 independently is C_1–C_4 alkyl or phenyl;

Z is oxygen or sulfur;

X is a therapeutically acceptable anion; and

m is 1 or 2;

with the proviso that when R^1 is methyl, R^2 and R^3 are hydrogen, Z is oxygen, and X is bromine, R^4 is other than 4-methoxy and 4-methyl.

4,683,313
2-ALKYL(OR PHENYL)THIO-6-N ALKYL ERGOLINES AND 4-DIALKYLAMINOTETRAHYDROBENZ[c,d]INDOLES

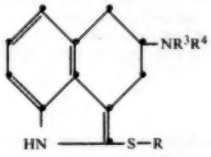
Bennett C. Laguzza; Cynthia L. Nichols, and Nicholas J. Bach, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 24, 1985, Ser. No. 747,753

Int. Cl.[4] C07D *209/90, 457/02;* **A61K** *31/48*

U.S. Cl. 548—437 **2 Claims**

1. A compound of the formula:



II

wherein R is C_{1-3} alkyl or phenyl and R^3 and R^4 are individually methyl, ethyl or n-propyl; and pharmaceutically-acceptable, acid-addition salts thereof.

4,683,314

3-O-BENZYL-2,4,6-TRIDEOXY-6-IODO-ALPHA-D-ERYTHRO-HEXOPYRANIDE USEFUL FOR PREPARING INHIBITORS OF 3-HYDROXY-3-METHYLGLUTARYL COENZYME A REDUCTASE

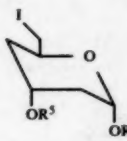
John D. Prugh, Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 731,693, May 8, 1985, abandoned, which is a division of Ser. No. 568,977, Jan. 6, 1984, Pat. No. 4,540,796, which is a division of Ser. No. 373,605, May 3, 1982, Pat. No. 4,440,927, which is a continuation-in-part of Ser. No. 275,521, Jun. 19, 1981, abandoned. This application Apr. 28, 1986, Ser. No. 858,899

Int. Cl.[4] C07D 309/06

U.S. Cl. 549—417 2 Claims

1. The compound



wherein R^4 is C_{1-3} alkyl and R^5 is benzyl, or 4-methoxybenzyl.

4,683,315

REDUCTIVE COUPLING OF LINEAR CARBON-CONTAINING LIGANDS VIA TRANSITION METAL COMPLEXES

Stephen J. Lippard, and Patricia A. Bianconi, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

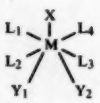
Filed Aug. 1, 1985, Ser. No. 761,399

Int. Cl.[4] C07F 9/00

U.S. Cl. 556—12 9 Claims

1. A process for the formation of an isolable C_2 containing compound comprising the steps:

(a) reacting an early transition metal seven coordinate complex of the formula:



(I)

wherein;

M is an early transition metal selected from the group consisting of vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, technetium, and rhenium;

Y_1 and Y_2 are each independently selected from the group of linear carbon-containing ligands consisting of C=O, CNR, NCR, —C≡CR, CN, C=S, CO_2 and CS_2, wherein R is hydrogen, an alkyl group, or an aryl group, with the exception that Y_1 and Y_2 are not both CNR;

L_1, L_2, L_3, and L_4, are each independently selected from ligands that are 2-electron donors;

X is halogen or pseudohalogen;

with a second metal complex of the formula:

$$M'X_2L_1'L_2'$$

wherein:

M' is a Lewis Acid selected from the group consisting of Ti, Zr, Hg, Al, Zn, Mg, and Na;

L_1' and L_2' are ligands selected from the group consisting of cyclic hydrocarbons which ensure a cis orientation of Y_1 and Y_2 groups upon reaction with Formula I above;

in the presence of a sufficient quantity of a reducing agent selected to effect the formation of a complex wherein Y_1 and Y_2 are bound to both M and M'; and

(b) reacting the species formed in step (a) with a sufficient quantity of a Lewis Acid such that an isolable species is formed, said species containing a new C_2 bond between the Y_1 and Y_2 carbon atoms bound to M.

4,683,316

METHOD OF PREPARATION OF DITHIOCARBAMATE COMPLEXES OF MOLYBDENUM (VI)

Gopal H. Singhal, Houston, Tex., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jan. 2, 1986, Ser. No. 815,604

Int. Cl.[4] C07F 11/00

U.S. Cl. 556—38 13 Claims

1. A method for preparing a dihydrocarbyl substituted dithiocarbamate of molybdenum (VI) comprising the steps of:

(a) combining a salt of a dihydrocarbyl substituted dithiocarbamate, each of said dihydrocarbyl substitutions being the same or a different hydrocarbon radical selected from the group consisting C_1–C_{18} straight and branched chain aliphatic radicals, C_5–C_8 cycloalkyl radicals, alkyl substituted cycloalkyl radicals having from 1 to 3 carbon atoms in the alkyl group and from 5 to 7 carbon atoms in the cycloalkyl group, aryl and aklyl aryl radicals having from 1 to 4 carbon atoms in the akly portion thereof and 6 carbon atoms in the aryl portion thereof or both of said dihydrocarbyl substitutions may be a single cyclo or cycloakyl radical having from about 5 to about 10 carbon atoms, said salt being selected from the group consisting of alkali metal salts, ammonium salts and substituted ammonium salts, wherein one or more of the hydrogen atoms of the ammonium ion is replaced with a hydrocarbon radical, selected from the same group as previously recited, an alkali metal molybdate and an organic acid in an inert atmosphere and at a temperature within the range from about −10° C. to about +25° C., the amount of organic acid present being sufficient to provide a pH within the range from about 5.0 to about 8.0; and

(b) recovering a dihydrocarbyl substituted dithiocarbamate of molybdenum (VI).

4,683,317

PHOTOPOLYMERIZABLE ORGANIC COMPOSITIONS AND DIARYLIODONIUM SALTS USED THEREIN

James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 497,357, May 23, 1983, Pat. No. 4,529,490. This application Apr. 8, 1985, Ser. No. 721,244

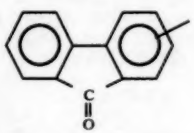
Int. Cl.[4] C07F 9/66, 9/00, 5/02

U.S. Cl. 556—64 5 Claims

1. Arylketone containing iodonium salts of the formula

$$[RR^1I]^+X^-,$$

where R is a $C_{(6-13)}$ monovalent aromatic hydrocarbon radical or halo substituted $C_{(6-13)}$ monovalent aromatic hydrocarbon radical and R^1 is a monovalent aryl ketone group which is attached to iodine to form a carbon-iodine linkage selected from the class consisting of



and X^- is a counter ion selected from the class consisting of

tosylate, tetrafluoroborate, hexafluorophosphate, hexafluoroarsenate, and hexafluoroantimonate.

4,683,318

HYDROPHOBIC, CRYSTALLINE, MICROPOROUS SILACEOUS MATERIALS OF REGULAR GEOMETRY

Kenneth S. Deffeyes, Princeton, N.J., and Aaron A. Rosenblatt, New York, N.Y., assignors to The Scopas Technology Company, Inc., New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,460
Int. Cl.[4] C07F 5/06
U.S. Cl. 556—173 19 Claims

1. A hydrophobic microporous crystalline tectosilicate material of regular geometry comprising aluminum-free sites in a silaceous lattice that are characterized by the presence of about 1–4 associated moieties of the formula ≡SiOR wherein R is a substituent that is a weaker point electric source than aluminum.

4,683,319

THERMAL STABILIZER FOR ORGANOPOLYSILOXANE OILS

Makoto Yoshitake, and Keiichi Kishimoto, both of Tokyo, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,328
Claims priority, application Japan, Nov. 7, 1985, 60-249743
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—425 14 Claims

1. A composition comprising the reaction product of: (A) an organopolysiloxane which possesses at least 10 siloxane units and has the average unit formula

$$R_aSiO_{(4-a)/2}$$

wherein R is a monovalent hydrocarbon group and a is 1.4 to 2.3 with (B) from 0.01 to 10 parts by weight of an aromatic aminophenol per 100 parts of said organopolysiloxane (A), in the presence of (C) from 0.001 to 1.0 parts by weight of a quaternary phosphonium hydroxide per 100 parts of said organopolysiloxane (A).

4,683,320

NOVEL ORGANOPOLYSILOXANE, METHOD FOR THE PREPARATION THEREOF AND COMPOSITION CONTAINING THE SAME

Yoshinori Hida, and Shohei Kozakai, both of Annaka, Japan, assignors to Shin -Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1986, Ser. No. 878,002
Claims priority, application Japan, Jun. 26, 1985, 60-139743
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—453 7 Claims

1. An organopolysiloxane represented by the general structural formula

$$(R_a^3, R_b^4)\,Si—O—SiR^1R^2—O\,]_m\,[—SiR^5R^6—O—]_n\,—[—SiR^1R^2—O—]_m\,Si(R_a^3, R_b^4),$$

in which R^1 is a vinyl group, R^2 is a methyl group, R^3 and R^4 are each a monovalent hydrocarbon group, R^5 and R^6 are each monovalent hydrocarbon groups free from aliphatic unsaturation, a+b are each zero or a positive integer not exceeding 3 with the proviso that a+b is 3, m is a positive integer of at least 3 and n is a positive integer of at least 6, the —SiR^1R^2—O— units included within the square brackets including m units being connected together in an uninterrupted sequence and bonded directly to the terminal triorganosiloxy unit (R_a^3, R_b^4)SiO—.

4,683,321

PREPARATION OF DIALKYLDIALKOXYSILANES AND RELATED COMPOUNDS

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 27, 1986, Ser. No. 923,184
Int. Cl.[4] C07F 7/18
U.S. Cl. 556—478 5 Claims

1. A process for preparing a dialkyldialkoxysilane, $R^1R^2Si(OR^3)_2$, said process comprising reacting an alkali metal aluminum tetraalkyl, $MAlR^1_4$, with a silicon-containing reactant selected from the class consisting of:

(i) tetraalkyl silicates, $Si(OR^3)_3$, and

(ii) alkyltrialkoxysilanes, $R^2Si(OR^3)_3$,

wherein R^1 is an alkyl radical of 2–18 carbons, R^2 is an alkyl radical of 1–18 carbons, R^3 is an alkyl radical of 1–4 carbon atoms, and M is an alkali metal selected from lithium, sodium, and potassium.

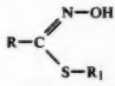
4,683,322

PROCESS FOR THE PRODUCTION OF METHOMYL OXIME

Zohar Oren, Beer Sheva, Israel, assignor to Makhteshim Chemical Works Ltd., Beer Sheva, Israel

Filed Dec. 4, 1985, Ser. No. 805,424
Claims priority, application Israel, Dec. 5, 1984, 73749
Int. Cl.[4] C07C 119/18
U.S. Cl. 558—3 8 Claims

1. A process for the production of alkyl thiolhydroxamates of the formula:

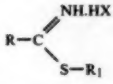


wherein

R is lower alkyl or lower methoxyalkyl;

R_1 is lower alkyl or cyanoalkyl, which comprises preparing a reaction mixture of:

(a) an anydrous hydroxylamine salt selected from the group consisting of hydroxylamine hydrochloride, hydroxylamine hydrobromide, hydroxylamine sulfate, and hydroxylamine acid sulfate;



wherein R and R_1 are as defined; and HX is an inorganic acid selected from the group consisting of hydrogen chloride, hydrogen bromide, and hydrogne sulfate;

(c) a solvent selected from the group consisting of acetonitrile, isobutyronitrile, hydrocargon solvents, and chlorinated hydrocarbon solvents, to give a reaction mixture of pH 0; adding thereto an ammonium, alkali or alkaline earth metal carbonate or bicarbonate and maintaining the mixture at a temperature between 25° and 50° C., mixing the reactants at an initial pH of no greater than zero and maintaining the reaction until the reaction is complete while keeping the pH below 2 to the end of the reaction, and recovering the alkyl thiolhydroxamate which is formed.

4,683,323

METHOD FOR INVERSION OF OPTICALLY ACTIVE 4-HYDROXY-2-CYCLOPENTENONES

Masayoshi Minai, Moriyama, and Yuji Ueda, Izumi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 758,801

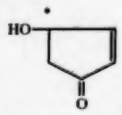
Claims priority, application Japan, Jul. 31, 1984, 59-162739; Aug. 3, 1984, 59-164018; Sep. 25, 1984, 59-199995; Sep. 29, 1984, 59-204315

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.[4] C07C *143/68*

U.S. Cl. 558—52 30 Claims

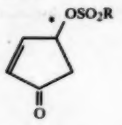
1. A method for inversion of an optically active 4-hydroxy-2-cyclopentenone which comprises hydrolyzing under neutral or acid conditions a sulfonic acid ester of the raw material optically active 4-hydroxy-2-cyclopentenone having the following formula



wherein the mark * shows asymmetric carbon atom representing (R)- or (S)-configuration,

to obtain an optically active 4-hydroxy-2-cyclopentenone having a configuration as an antipode of the raw material above.

29.



where R is a lower alkyl group, a trifluoromethyl group, a phenyl group, or a substituted phenyl group, which compound is a sulfonic acid ester of the optically active 4-hydroxy-2-cyclopentenone.

4,683,324

PROCESS FOR THE RESOLUTION OF CERTAIN RACEMIC AMINO NITRILES

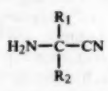
William H. Gastrock, Hightstown, and Peter J. Wepplo, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 25, 1982, Ser. No. 381,828

Int. Cl.[4] C07C *121/42*

U.S. Cl. 558—354 4 Claims

1. A process for the concomitant resolution-racemization-resolution of racemic amino nitriles of formula



wherein R_1 is C_1–C_4 alkyl; R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl provided that when R_1 and R_2 are selected from C_1–C_4 alkyl, they cannot be the same, comprising: react molar amount of the above racemic aminonitrile with from 0.5 to 1.2 molar amount of resolved (+) or (−)-tartaric acid in the presence of a solvent of methanol, ethanol 2-propanyl or a mixture of methanol and methylene chloride, at a temperature range of from +5° C. to +50° C.,for a period of time from one hour to forty hours or until essentially most of the racemic aminonitrile is converted to the optically active tartrate salt of the desired isomer.

4,683,325

LEUKOTRIENE ANTAGONISTS

Richard Frenette; Joshua Rokach, both of Laval, Canada; Masatoshi Kakushima, Hirochi, Japan, and Robert N. Young, Senneville, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 573,169, Jan. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 546,013, Oct. 27, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,560

Int. Cl.[4] C07C *149/40*

U.S. Cl. 560—10 12 Claims

1. Methyl 5-(3-(4-acetyl-3-hydroxy-2-n-propylphenoxy)-propyloxy) -1-indanone-2-acetate.

4,683,326

SOLVENT-FREE CRYSTALLIZATION OF PENTAERYTHRITOL TETRAKIS-[3-(3,5-DI-TERT-BUTYL-4-HYDROXY-PHENYL)PROPIONATE] AND THE NOVEL ALPHA-CRYSTALLINE FORM THEREOF

Ivan Orban, and Werner Fussenegger, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 10, 1986, Ser. No. 884,254

Claims priority, application Switzerland, Jul. 19, 1985, 3146185

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—75 11 Claims

1. A process for the complete, solvent-free crystallisation of pentaerythritol tetrakis-[3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate], which comprises seeding a melt of this compound in an extruder, a kneader or an internal mixer with at least 0.1 to 5% by weight, based on said melt, of the β-, δ- or λ-crystal modification of said compound, at a temperature in the range from 70° to 130° C.

4,683,327

ANISOTROPIC HEAT-CURABLE ACRYLIC TERMINATED MONOMERS

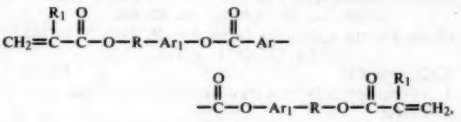
Robert W. Stackman, Racine, Wis., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 24, 1985, Ser. No. 748,293

Int. Cl.[4] C07C *69/82, 69/773*

U.S. Cl. 560—86 17 Claims

1. Heat-curable acrylic-terminated monomer capable of forming an anisotropic melt phase of the formula:



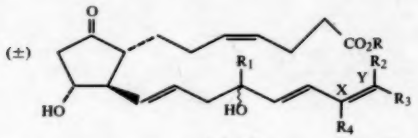
wherein Ar is a divalent radical comprising at least one aromatic ring, Ar_1 is a divalent radical selected from the group consisting of phenylene, naphthalene, biphenylene and mixtures thereof, R is selected from the group consisting of an alkylene group having from one to four carbon atoms and an oxyalkylene group having from one to four carbon atoms, and R_1 is selected from the group consisting of hydrogen and methyl, wherein hydrogen atoms present on the aromatic rings in said divalent radicals Ar and Ar_1 may be replaced by substitution selected from the group consisting of an alkyl group having one to four carbon atoms, an alkoxy group having one to four carbon atoms, halogen, phenyl, and mixtures thereof.

4,683,328
TETRAENYL PROSTAGLANDINS

Paul W. Collins, Deerfield, and Alan F. Gasiecki, Vernon Hills, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 25, 1985, Ser. No. 801,370
Int. Cl.[4] C07C *177/00*
U.S. Cl. 560—118 7 Claims

1. A compound of the formula



wherein R represents hydrogen or lower alkyl having 1 to 6 carbon atoms; R_1 represents hydrogen, vinyl, or lower alkyl having 1 to 4 carbon atoms and the wavy line represents R or S stereochemistry; R_2, R_3 and R_4 are hydrogen or lower alkyl having 1 to 4 carbon atoms or R_2 and R_3 together with carbon Y form a cycloalkenyl having 4 to 6 carbon atoms or R_3 and R_4 together with carbons X and Y form a cycloalkenyl having 4 to 6 carbons.

4,683,329
BENEFICIAL USE OF WATER IN CATALYTIC CONVERSION OF FORMAMIDES TO ISOCYANATES

Velliyur N. M. Rao, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Apr. 16, 1986, Ser. No. 852,707
Int. Cl.[4] C07C *71/00*
U.S. Cl. 560—338 6 Claims

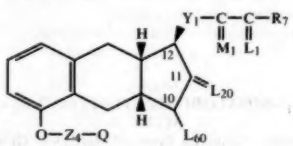
1. An improved process for preparing isocyanates of the formula R—NCO, wherein R is C_{1-3} alkyl, by reacting a corresponding formamide of the formula R-NHCHO with oxygen or an oxygen-containing gas at a temperature from about 400° C. to about 800° C., in the presence of a silver catalyst, wherein the improvement comprises feeding water and formamide in vapor form to provide a reaction feed mixture having a mole ratio of water to formamide from about 0.1 to about 10.0.

4,683,330
INTERPHENYLENE CARBACYCLIN DERIVATIVES

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

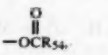
Continuation-in-part of Ser. No. 587,337, Mar. 8, 1984, abandoned. This application Jan. 11, 1985, Ser. No. 690,804
Int. Cl.[4] C07C *177/00*
U.S. Cl. 560—51 15 Claims

1. A compound of the formula:



wherein Q is

(1) —$COOR_1$, wherein R_1 is
- (a) hydrogen;
- (b) (C_1–C_{12}) alkyl;
- (c) (C_3–C_{10}) cycloalkyl;
- (d) (C_7–C_{13}) aralkyl;
- (e) phenyl, optionally substituted with one, 2 or 3 chloro or (C_1–C_3) alkyl;
- (f) phenyl substituted in the para position by
  - (i) —$NHCOR_{25}$,
  - (ii) —COR_{26},
  - (iii)



or
  - (iv) —CH=N—$NHCONH_2$ wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; R_{54} is phenyl or acetamidophenyl; inclusive; or
- (g) a pharmacologically acceptable cation;

(2) —CH_2OH;

(3) —COL_4, wherein L_4 is
- (a) amino of the formula —$NR_{51}R_{52}$ wherein R_{51} and R_{52} are
  - (i) hydrogen,
  - (ii) (C_1–C_{12}) alkyl,
  - (iii) (C_3–C_{10}) cycloalkyl,
  - (iv) (C_7–C_{12}) aralkyl,
  - (v) phenyl, optionally substituted with one 2 or 3 chloro, (C_1–C_3) alkyl, hydroxy, carboxy, (C_2–C_5) alkoxycarbonyl, or nitro,
  - (vi) (C_2–C_5) cyanoalkyl,
  - (vii) (C_2–C_5) carboxyalkyl,
  - (viii) (C_2–C_5) carbamoylalkyl,
  - (ix) (C_3–C_6) acetylalkyl,
  - (x) (C_7–C_{11}) benzoalkyl, optionally substituted by one, 2 or 3 chloro, (C_1–C_3) alkyl, hydroxy, (C_1–C_3) alkoxy, carboxy, (C_2–C_5) alkoxy carbonyl, or nitro,
  - (xi) pyridyl, optionally substituted by one, 2 or 3 chloro, (C_1–C_3) alkyl, or (C_1–C_3) alkoxy,
  - (xii) (C_6–C_9) pyridylalkyl optionally substituted by one, 2 or 3 chloro, (C_1–C_3) alkyl, hydroxy, or (C_1–C_3) alkoxy,
  - (xiii) (C_1–C_4) hydroxyalkyl,
  - (xiv) (C_1–C_4) dihydroxyalkyl,
  - (xv) (C_1–C_4) trihydroxyalkyl, with the proviso that not more than one of R_{51} and R_{52} is other than hydrogen or alkyl;
- (b) cycloamino selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethylenimino, pyrrolino, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1–C_{12}) alkyl of one to 12 carbon atoms, inclusive;
- (c) carbonylamino of the formula —$NR_{53}COR_{51}$ wherein R_{53} is hydrogen or (C_1–C_4) alkyl and R_{51} is other than hydrogen, but otherwise defined as above;
- (d) sulfonylamino of the formula —$NR_{53}SO_2R_{51}$, wherein R_{51} and R_{53} are defined in (c);

(4) —$CH_2NL_2L_3$ wherein L_2 and L_3 are hydrogen or (C_1–C_4) alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when X_1 is —$CH_2NL_2L_3$;

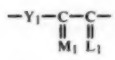
(5) —CN;

wherein Z_4 is —CH_2—, —CH_2CH_2—, —CF_2—, or —CH_2CF_2;

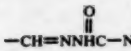
wherein L_{20} is α-OH,β-H; α-H,β-OH, H,H; α-CH_3, β-H; α-CH_2OH,β-H; =O; or =CH_2; wherein L_{60} is hydrogen or L_{20} and L_{60} taken together form a double bond between positions 10 and 11;

wherein Y_1 is —CH_2CH_2—, —SCH_2—, —C≡C—, trans —CH=CH—, or cis —CH=CH—;

wherein



taken together is



wherein M_1 is α-H:β-H; =O; α-OH:β-R_5; or α-R_5:β-OH; wherein R_5 is hydrogen or methyl;

wherein L_1 is

(1) α-R_3:β-R_4, α-R_4:β-R_3, or mixtures thereof wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

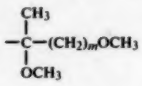
(2) or when M_1 is α-H:β-H L_1 is α-OH:β-R_3, α-R_3:β-OH; or a mixture of α-OH:β-R_3 and α-R_3:β-OH wherein R_3 is hydrogen, methyl, vinyl, or ethynyl;

wherein R_7 is $-(CH_2)_m-OCH_3$, wherein m is an integer from 2 to 5, inclusive and said group is straight or branched; or

wherein

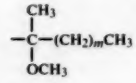
taken together is

(1)



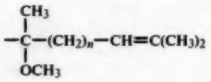
wherein m is an integer of from 2 to 5 inclusive;

(2)



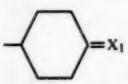
wherein m is an integer of from 2 to 5 inclusive;

(3)



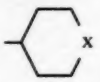
wherein n is an integer of from 1 to 4 inclusive; or

(4)



wherein X_1 is =O; F,F; α-H,β-OH and α-OH,β-H;

(5)



wherein X is —O—, —S—, or —NH;

(6)

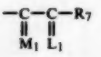
wherein X is as defined above;

(7)

wherein X is as defined above;

(8) phenyl optionally substituted with one, 2 or 3 chloro, fluoro, trifluoromethyl, C_1–C_3 alkyl, or C_1–C_3 alkoxy with the proviso that not more than two substituents are other than alkyl;

wherein

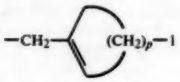


taken together is

(1)

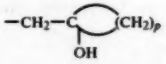
wherein p is an integer of from 3 to 7 inclusive;

(2)



wherein p is as defined above;

(3)



wherein p is as defined above; and the

(4) benzyl optionally substituted on the aromatic ring with one, 2 or 3 chloro, fluoro, trifluoromethyl, C_1–C_3 alkyl, or C_1–C_3 alkoxy with the proviso that not more than two substituents are other than alkyl;

individual optical enantiomers and salts thereof.

4,683,331

OMEGA-(2,4-DIHALOBIPHENYLYL) OXO ALKANOIC ACIDS

Miroslav Kuchar; Bohumila Brunova; Jaroslava Grimova, and Eva Maturova, all of Prague, Czechoslovakia, assignors to Spofa spojene podniky pro zdravotnickou, Prague, Czechoslovakia

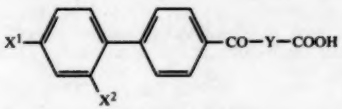
Filed Jul. 29, 1985, Ser. No. 760,338

Claims priority, application Czechoslovakia, Aug. 31, 1984, 6586-84

Int. Cl.[4] C07C *59/86*

U.S. Cl. 562—459 **4 Claims**

1. Omega-(2',4'-dihalobiphenylyl)oxo alkanoic acids of the formula



wherein X^1 and X^2 are each selected from the group consisting of a fluorine atom and a chlorine atom and Y is a bivalent hydrocarbon chain selected from the group consisting of $—CH_2—CH—CH_3$ and $(CH_2)_3$.

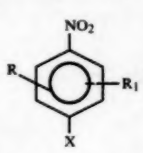
4,683,332

PARA-NITRODIPHENYLAMINE SYNTHESIS

Budd H. Sturm, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

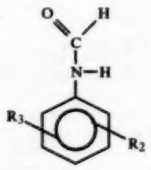
Filed May 20, 1985, Ser. No. 735,513
Int. Cl.[4] C07C *85/02*
U.S. Cl. 564—414 **11 Claims**

1. A process wherein (1) a para-halonitrobenzene conforming to the following structural formula:



(II)

wherein R and R_1 are selected from the group consisting of hydrogen radicals and alkyl radicals of 1 to 9 carbon atoms and wherein X is a halogen selected from the group consisting of chlorine and bromine; is reacted with (2) a formanilide of the following general structural formula:



wherein R_2 and R_3 are selected from the group consisting of hydrogen radicals, alkyl radicals of 1 to 9 carbon atoms and alkoxy radicals of 1 to 9 carbon atoms and cycloaklyl radicals of 5 to 6 carbon atoms; in the presence of (3) a neutralizing agent, selected from the group consisting of alkali metal salts, oxides of alkali metal salts and alkali metal hydroxides; (4) at a temperature of 120°-250° C.; (5) at a pressure from atmospheric to about 300 kPa; (6) with an excess of formanilide; wherein the improvement is characterized in that a catalyst is added to the formanilide/p-halonitrobenze reaction selected from the group consisting of (a) zinc (II) salts, (b) zinc (II) oxides, (c) zinc (II) sulfides and (d) organometallic zinc (II) compounds.

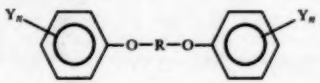
4,683,333

PROCESS FOR PREPARING SUBSTITUTED BIS-ETHERS

Thomas R. Britt, Denham Springs, and Willie C. Burton, Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1985, Ser. No. 800,885
Int. Cl.[4] C07C *85/24, 85/00*
U.S. Cl. 564—414 **23 Claims**

1. An aqueous process for preparing a water insoluble substituted bis-ether of the formula



wherein R is a divalent alkyl radical having from about 2 to about 40 carbon atoms, a divalent cycloalkyl radical having from about 3 to about 8 carbon atoms, a divalent bridged ring aliphatic radical having from about 5 to about 10 carbon atoms, a divalent aromatic radical, a divalent alkylaryl radical having from about 7 to about 30 carbon atoms or a divalent fused ring aromatic compound having from about 10 to about 14 carbon atoms; Y is a monovalent radical selected from the group consisting of an amino radical, a halogen radical, a hydroxy radical, an alkyl radical of 1 to 30 carbon atomS, an aryl radical of 6 to 14 carbon atoms, a cycloalkyl radical having from 3 to 8 carbon atoms, an alkylaryl radical having from 7 to 30 carbon atoms, a substituted alkylaryl radical, a substituted aryl radical or a substituted cycloalkyl radical; and n is an integer of from about 1 to about 5 inclusive, which process comprises:

(a) refluxing an admixture comprising (1) an organic dihalo compound, (2) an aqueous solution of a phenol which is substituted with at least one halogen-reactive moiety, and (3) an aqueous base solution, for a period of time sufficient to form an intermediate compound;

(b) hydrolyzing said intermediate compound with a mineral acid; and

(c) neutralizing said hydrolyzed compound with a base to provide the substituted bis-ether.

4,683,334

MODIFIED 8-RING ZEOLITES AS CATALYSTS FOR CONVERSION OF METHANOL AND AMMONIA TO DIMETHYLAMINE

Horacio E. Bergna, Wilmington, Del.; David R. Corbin, West Chester, Pa., and George Sonnichsen, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 30, 1985, Ser. No. 729,161
Int. Cl.[4] C07C *85/02, 85/06*
U.S. Cl. 564—474 **26 Claims**

1. A process for producing dimethylamine, comprising reacting methanol and/or dimethylether and ammonia, in amounts sufficient to provide a carbon/nitrogen (C/N) ratio from about 0.2 to about 1.5, and at a temperature from about 250° C. to about 450° C., in the presence of a catalytic amount of a modified acidic zeolite selected from the group consisting of chabazite, erionite, ZK-5, and rho, the zeolite having been modified by treatment with one or more compounds containing at least one element selected from the group consisting of silicon, aluminum, phosphorus, and boron, to deposit thereon at least 0.05 weight percent of the element.

4,683,335

CATALYTIC PROCESS FOR THE PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES WITH TUNGSTOPHOSPHORIC ACID-OR MOLYBDOPHOSPHORIC ACID-ON-TITANIA CATALYSTS

John F. Knifton, and Neal J. Grice, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 18, 1986, Ser. No. 909,042
Int. Cl.[4] C07C 85/06
U.S. Cl. 564—480 18 Claims

1. In a method wherein monoethanolamine is reacted with ethylenediamine in a reaction zone in the presence of a phosphorus-containing catalyst to provide an essentialy noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process on a continuous basis which comprises:

a. using, as a catalyst, titania pellets having deposited thereon a minor amount of a tungstophosphoric acid or a molybdophosphoric acid or a mixture thereof;

b. continuously contacting a mixture of ethylenediamine and monoethanolamine in a molar ratio of about 1 to 5 moles of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic reaction product.

4,683,336

PREPARATION OF AMINES

Clarence W. Blackhurst, 2801 Snouffer Rd., Worthington, Ohio 43085

Filed Dec. 13, 1985, Ser. No. 808,693
Int. Cl.[4] C07C 85/06
U.S. Cl. 564—480 24 Claims

1. A process for producing amines which comprises reacting an aliphatic alcohol or an aliphatic aldehyde with an aminating agent selected from the group of ammonia, primary amine, and secondary amine in the liquid phase in the presence of a catalytic amount of an unsupported catalyst comprising copper carbonate and a carbonate of a metal selected from the group of nickel, cobalt, and mixtures thereof.

4,683,337

PROCESS FOR THE RECOVERY OF ETHYLENE AMINES FROM AN AQUEOUS SOLUTION

Frederik J. Budde, Hengelo, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Filed Nov. 21, 1983, Ser. No. 553,971
Claims priority, application Netherlands, Nov. 23, 1983, 8204546
Int. Cl.[4] C07G 85/26
U.S. Cl. 564—498 5 Claims

1. A process for the recovery of ethylene amines from an aqueous solution thereof by extracting the solution with a water-immiscible, aliphatic, 4 to 10 carbon atoms-containing alcohol and purifying the resulting amine-containing extract liquid, characterized in that the extract liquid is purified by the absorption therein of carbon dioxide with conversion of the amines into carbamates, which are dissolved in a limited amount of water such that the concentration on the basis of amine is at least twice the concentration in the original aqueous solution, after which the ethylene amines are recovered from the resulting carbamate solution by decarbonation and dehydration in a manner known in itself.

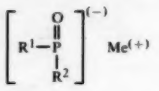
4,683,338

PROCESS FOR THE PREPARATION OF BIS-PHOSPHINEOXIDE COMPOUNDS

Richard L. Wife; Johannes J. M. Snel, and Aart B. Van Oort, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 13, 1985, Ser. No. 797,549
Claims priority, application United Kingdom, Nov. 22, 1984, 8429537
Int. Cl.[4] C07F 9/53
U.S. Cl. 568—12 10 Claims

1. A process for the preparation of phenylene-bis-phosphineoxide compounds which comprises reacting in the presence of a polar aprotic solvent difluorobenzene compound with a compound of the general formula



I

wherein Me is an alkali metal and R^1 and R^2 each independently represents an alkyl-, aryl- alkaryl- or aralkyl group, or R^1 and R^2 together form an alkylene group.

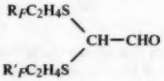
4,683,339

2,2-BIS-(2-PERFLUOROALKYLETHYLTHIO)-ACETALDEHYDES AND PROCESS FOR PRODUCTION THEREOF

Brigitte Bertaina; Aimé Cambon, both of Nice, and André Lantz, Vernaison, all of France, assignors to Atochem, France

Filed Nov. 26, 1985, Ser. No. 801,791
Claims priority, application France, Nov. 28, 1984, 84 18106
Int. Cl.[4] C07C 149/16
U.S. Cl. 568—41 4 Claims

1. 2,2-bis-(2-Perfluoroalkylethylthio)acetaldehydes having the formula:



(II)

wherein R_F and R'_F are the same or different and are a straight or branched perfluorinated chain, C_nF_{2n+1}, n being from one to 20.

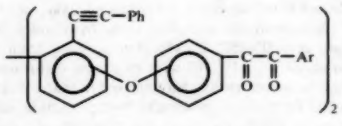
4,683,340

BIS(BENZILYLOXY) COMPOUNDS

Patricia M. Lindley, Springfield, Va.; Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 8, 1986, Ser. No. 916,964
Int. Cl.[4] C07C 49/794
U.S. Cl. 568—331 4 Claims

1. A bis(benzilyloxy) compound of the general formula:



wherein Ph is $—C_6H_5$ and Ar is Ph, $—C_6H_4Br$, $—C_6H_4CH_3$ or $—C_6H_4C_2H_5$.

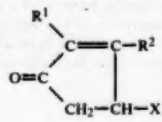
4,683,341

OPTICAL RESOLUTION OF OXYCYCLOPENTENONE

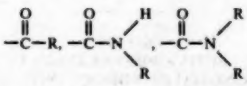
Kunio Ishii, Hasuda, and Tohru Shibata, Himeji, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Dec. 12, 1985, Ser. No. 808,593
Claims priority, application Japan, Dec. 19, 1984, 59-266294
Int. Cl.[4] C07C *45/79*
U.S. Cl. 568—366 **10 Claims**

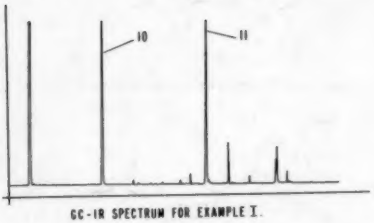
1. A method for chromatographically separating a mixture of optically active enantiomers having the formula



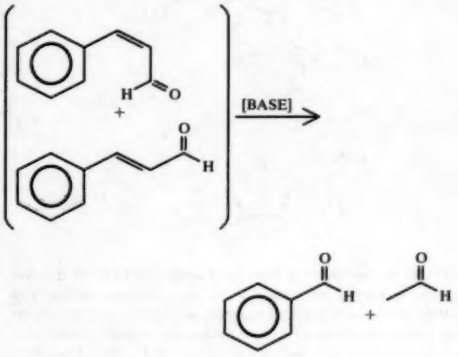
in which R^1 is hydrogen, alkyl having 1 to 10 carbons or alkyl having 1 to 10 carbon atoms and containing an aromatic group; R^2 is hydrogen, alkyl having 1 to 10 carbon atoms, alkyl having 1 to 10 carbon atoms and containing an aromatic group, unsaturated aliphatic group having 1 to 10 carbon atoms or unsaturated aliphatic group having 1 to 10 carbon atoms and containing an aromatic group; and X is OH or OR^3, wherein R^3 is a protective group for protecting a hydroxyl group, which comprises the steps of: under chromatographic separation conditions, passing said mixture with an eluant therefor into contact with a resolving agent comprising an optically active polysaccharide or a derivative thereof in which at least part of the hydrogen atoms on the hydrodoxyl groups of the polysaccharide are replaced by a member selected from the group consisting of



and R, wherein R is an aliphatic group having 1 to 3 carbon atoms, an alicyclic group having 3 to 8 carbon atoms, an aromatic group having 4 to 20 carbon atoms, or a heteroaromatic group having 4 to 20 carbon atoms.



GC-IR SPECTRUM FOR EXAMPLE I.



4,683,342

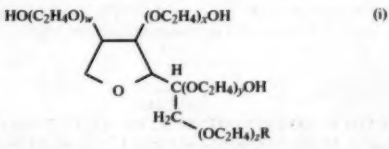
PROCESS FOR PREPARING NATURAL BENZALDEHYDE AND ACETALDEHYDE, NATURAL BENZALDEHYDE AND ACETALDEHYDE COMPOSITIONS, PRODUCTS PRODUCED THEREBY AND ORGANOLEPTIC UTILITIES THEREFOR

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Arthur L. Liberman, Highlands, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

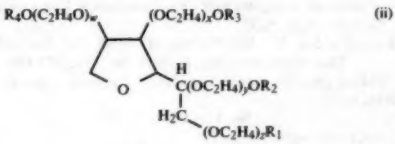
Continuation-in-part of Ser. No. 780,298, Sep. 26, 1985, Pat. No. 4,617,419. This application Aug. 13, 1986, Ser. No. 896,174
Int. Cl.[4] C07C *45/72*
U.S. Cl. 568—464 **4 Claims**

1. A process for preparing a composition of matter containing a substantial quantity of natural benzaldehyde and/or acetaldehyde comprising the step of carrying out a retro-aldol reaction on naturally occurring cinnamaldehyde in the presence of base, a natural or food grade nonionic emulsifier and an inert solvent selected from the group consisting of water and mixtures of water and C_1–C_5 alkanols and in the absence of any other reagents according to the reaction:

and simultaneously or subsequently steam distilling the reaction product from the reaction mass, the reaction being carried out in the presence of a nonionic sorbitan derivative emulsifier selected from the group consisting of compositions defined according to the structures:

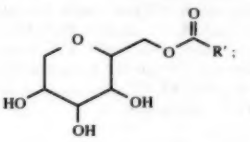


(i)



(ii)

mixtures of materials having the structures: (iii)



and

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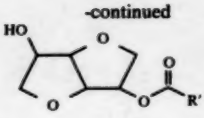
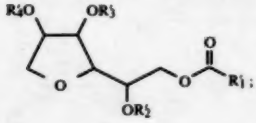
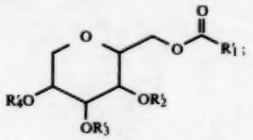


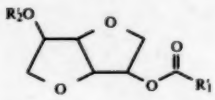
and

mixtures of materials having the structures: (iv)





and



wherein R represents a fatty acid moiety selected from the group consisting of laurate, palmitate, stearate, oleate and tallate; wherein R' represents a fatty acid moiety selected from the group consisting of laurate, palmitate, stearate, oleate and tallate; wherein one, two, three or four of R_1, R_2, R_3 and R_4 represents the same or different laurate, palmitate, stearate, oleate or tallate and the other of R_1, R_2, R_3 and R_4 represents hydrogen; and wherein one, two, three or four of R_1', R_2', R_3', and R_4' represents the same or different laurate, palmitate, stearate, oleate or tallate; and wherein W+X+Y+Z is in the range of from 4 up to 80, and wherein the reaction is carried out at from about 0.2 up to about 10 atmospheres; at a temperature of from about 40° C. up to about 150° C. and for a period of time of from about 5 hours up to about 80 hours.

4,683,343

ETHER-CONTAINING MIXTURES IN FLEXIBLE PVC

Jean A. Hanin, Rixensart, and Pierre E. Verrier, Brussels, both of Belgium, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 803,085, Nov. 27, 1985, Pat. No. 4,656,215. This application Dec. 5, 1986, Ser. No. 938,408

Claims priority, application United Kingdom, Nov. 30, 1984, 8430224

Int. Cl.[4] C07C *43/30*

U.S. Cl. 568—594 **7 Claims**

1. An ether rich hydroformylation-coproduct mixture comprising ether, ether-alcohol and acetal components which is obtained by hydrogenation and subsequent distillation of the crude product derived from the catalytic hydroformylation of a C_6-C_{12} olefinic feedstock with synthesis gas to yield a bottoms product, followed by catalytic steam cracking of such bottoms product at 260°-380° C. using as catalyst an active metal oxide or pseudo metal oxide.

4,683,344

PROCESS FOR THE PREPARATION OF AN ORGANOMAGNESIUM COMPOUND

Robert B. Hodek, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 575,089, Jan. 30, 1984, Pat. No. 4,508,646. This application Jan. 11, 1985, Ser. No. 690,443

Int. Cl.[4] C07C *39/00, 39/02, 39/04*

U.S. Cl. 568—716 **7 Claims**

1. A process for the preparation of a pulverulent organomagnesium compound comprising bringing together into intimate admixture a particulate hydroxyl functional material with an organomagnesium-containing material at a temperature below the melting point of the hydroxyl functional mataerial but at a temperature sufficient to convert at least a portion of the hydroxyl functional material to said pulverulent organomagnesium compound.

4,683,345

PREPARATION AND USE OF SUBSTITUTED BISPHENOLS

Guy Lejeune, Neuilly-Sur-Seine, France, assignor to Colette Nouvel, France

Filed Apr. 16, 1986, Ser. No. 852,409

Claims priority, application France, Apr. 16, 1985, 85 05681

Int. Cl.[4] C07C *39/16*

U.S. Cl. 568—726 **17 Claims**

1. In the process of preparation of a bisphenol by condensing a phenol, carrying a halogen substituent and alkyl groups, with an aldehyde in a solvent for the phenol in the presence of sulfuric acid, the improvement which comprises the proportion of acid with respect to the phenol being 21 to 171 g H_2SO_4 per mole of phenol such that, after the condensation and absorption by the acid of the water eliminated, the acid contains less than 50% of water by weight, and the reaction takes place at a temperature in the range from 40° to 65° C.

4,683,346

SELECTIVE PREPARATION OF MONOHALOHYDROQUINONES

Serge Ratton, Villefontaine, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Dec. 19, 1985, Ser. No. 810,753

Claims priority, application France, Dec. 19, 1984, 84 19748

Int. Cl.[4] C07C *39/10*

U.S. Cl. 568—765 **11 Claims**

1. A process for the essentially selective nascent chlorination of hydroquinone to monochlorohydroquinone, comprising reacting hydroquinone with an aqueous solution of hydrochloric acid and hydrogen peroxide, in the presence of an ether solvent for, and inert to, said hydroquinone.

4,683,347

GLYCERINE PURIFICATION PROCESS

Zaida Diaz, Houston, and James H. Miller, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 23, 1986, Ser. No. 877,051

Int. Cl.[4] C07C *29/86, 31/22*

U.S. Cl. 568—869 **13 Claims**

1. A process for reducing the level of acetals and/or ketals in glycerine which contains acetals and/or ketals, which process comprises:

(a) extracting said glycerine in an extraction zone with CO_2 at conditions above or near the critical point of CO_2 to obtain (1) an extract comprising CO_2, acetals and/or ketals and a minor amount of glycerine, and (2) glycerine having reduced acetals and/or ketals content, and

(b) separating said extract from said glycerine having reduced acetals and/or ketals content.

4,683,348

SOLAR CELL ARRAYS

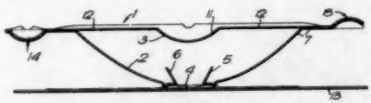
Alastair N. Pidgeon, Turin, Italy, and Arthur L. Webb, Guildford, England, assignors to The Marconi Company Limited, England

Filed Apr. 23, 1986, Ser. No. 855,513

Claims priority, application United Kingdom, Apr. 26, 1985, 8510706

Int. Cl.[4] H01L *25/02*

U.S. Cl. 136—246 **6 Claims**



1. A rigid, self-supporting construction for a solar cell array, comprising:

(a) a first unitary member composed of carbon fiber composite material, said first member having a plurality of paraboloid-shaped portions spaced apart of, and integrally interconnected with, one another, said paraboloid-shaped portions having reflecting surfaces located in the path of incident light and serving as primary reflectors to reflect the incident light;

(b) a second unitary member composed of carbon fiber composite material and rigidly secured to the first unitary member, said second member having a plurality of hyperboloid-shaped portions spaced apart of, and integrally interconnected with, one another, said hyperboloid-shaped portions being respectively positioned within the paraboloid-shaped portions and having reflecting surfaces located in the path of the light reflected from the primary reflectors and serving as secondary reflectors to redirect the light impinging thereon;

(c) a generally planar, heat radiator member composed of carbon-carbon material, said radiator member being rigidly secured to the first and second unitary members to form a rigid, self-supporting assembly therewith, said radiator member supporting a plurality of solar cells respectively positioned within the paraboloid-shaped portions in the path of the light redirected by the secondary reflectors to generate electrical energy, said radiator member having a high thermal conductivity for conveying unwanted heat away from the solar cells; and

(d) a plurality of light catcher cones each mounted between the members for rigidifying the assembly and surrounding respective solar cells to permit off-pointing tolerance.

4,683,349

ELASTIC ELECTRIC CABLE

Norichika Takebe, 11-go, 5-ban, Taiheji 2-chome, Kashihara-shi, Osaka, Japan

Filed Sep. 25, 1985, Ser. No. 779,962

Claims priority, application Japan, Nov. 29, 1984, 59-252484; Jan. 21, 1985, 60-7126[U]

Int. Cl.[4] H01B *7/06*

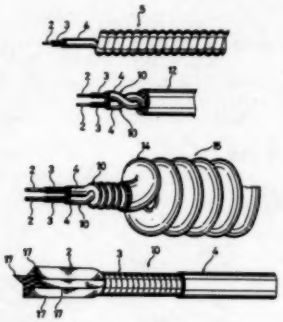
U.S. Cl. 174—69 **57 Claims**

1. An elastic electric cable comprising an elastic and deformable linear core member, wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering the outer surface of said conductor.

6. An elastic electric cable comprising an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering the outer surface of said wound conductor, the entire body thereof being wound at close pitches like a coiled spring.

13. An elastic electric cable comprising an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, an insulator made of elastic and deformable material covering the outer surface of said spirally wound conductor, an outer conductor for noise prevention spirally wound around said insulator, and a sheath made of an elastic and deformable material covering said outer conductor.

33. An elastic electric cable comprising core cables each composed of an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape,



a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering said wound conductor, in which a plurality of said core cables are twisted together and a sheath made of an elastic, and deformable material is provided covering the outer periphery of said twisted core cables.

52. An elastic electric cable comprising elastic and deformable core cables each composed of an elastic and deformable linear core member wherein said core member is provided with longitudinally protrusive ribs at the periphery thereof, said ribs in cross section being generally triangular, trapezoidal or arcuate in shape, a conductor spirally wound around said core member, and an insulator made of an elastic and deformable material covering the outer surface of said wound conductor, in which a plurality of core cables are spirally wound and a sheath made of an elastic and deformable material is provided around said core cables, the entire body thereof being spirally wound at close pitches like a coiled spring.

4,683,350

BUSHING FOR BX CABLE

Lucien C. Ducret, 9 Tod's Driftway, Old Greenwich, Conn. 06870

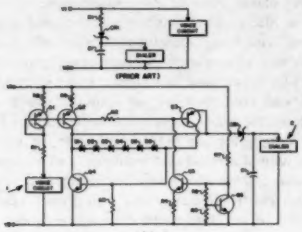
Filed Oct. 22, 1986, Ser. No. 922,061

Int. Cl.[4] H01B *17/58*

U.S. Cl. 174—83 **14 Claims**

1. A protective bushing for wires projecting from an armored cable end having a helical edge portion and an edge portion parallel to the cable longitudinal axis, said bushing comprising a cylindrical tubular body portion adapted to be fitted within said end of said cable between the armor and said wires, a radially outwardly projecting rim at an upper end of said body portion, and a raised flange integral with said body and rim and extending at least partially circumferentially

around the body portion, said flange having a lower surface adapted to rest against said helical edge portion of the armored



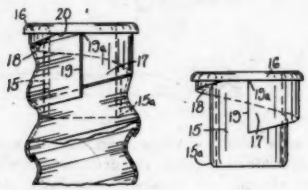
cable end when said body portion is fitted within said cable end.

4,683,351

IMPEDANCE MAINTENANCE CIRCUIT FOR TELEPHONE INTERFACE

Robert G. Thomson, Tempe, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Oct. 4, 1985, Ser. No. 784,065
Int. Cl.⁴ H04M *1/00, 19/00*
U.S. Cl. 379—398 **15 Claims**



11. In an interface circuit for customer premises telecommunications equipment, the interface circuit for coupling to a telephone central office through first and second input terminals and including a bypass element coupled across the input terminals for maintaining a minimum current flow sufficient to preserve the connection of the interface circuit to the central office, a nonsaturating supply of current for pendant portions of the interface circuit, the supply coupled across the input terminals and to the bypass element and comprising:

a source transistor having a first terminal coupled to the first input terminal, a second terminal coupled to the bypass element, and a third terminal coupled to the pendant portions of the interface circuit for supplying current to those portions,

a current sink coupled between the third terminal of the source transistor and an input terminal for selectively enhancing the current drawn on the source transistor,

a voltage offset element, and

a normally nonconducting sensing transistor having an emitter coupled to the collector of the source transistor and a base coupled through the voltage offset element to the base of the source transistor and a collector coupled to the current sink, whereby a circuit loop is formed and

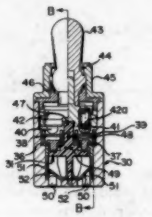
includes the base-collector junction of the source transistor, the emitter-base junction of the switching transistor, and the voltage offset element so that in the event that the base-collector junction of the source transistor should approach a forward-biased condition, the sensing transistor is caused to conduct current for driving the current sink and enhancing the current drain on the source transistor and accordingly preclude the saturation of the source transistor.

4,683,352

CHANGEOVER SWITCH

Takashi Yano, Yokohama, and Yasuo Yoneyama, Kawasaki, both of Japan, assignors to Fujisoku Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 10, 1986, Ser. No. 884,183
Claims priority, application Japan, Jul. 17, 1985, 60-109269[U]
Int. Cl.⁴ H01H *9/00, 21/04, 1/58*
U.S. Cl. 200—6 R **3 Claims**



1. A changeover switch comprising:

a casing body;

first switch means including first and second fixed contacts located inside the casing body, a first common contact located between the first and second fixed contacts, and a first movable contact strip means attached to the first common contact for alternatively touching the first and second fixed contacts;

second switch means including a third and fourth fixed contacts located inside the casing body, a second common contact located between the third and fourth fixed contacts, and a second movable contact strip means attached to the second common contact for alternatively touching the third and fourth fixed contacts;

operating means for actuating the first and second movable contact strip means concurrently in order to connect the first and third fixed contacts to the first and second common contacts, respectively, or connect the second and fourth fixed contacts to the first and second common contacts, respectively;

a partition wall provided between the first and second switch means in the casing body, to divide the switch means; and

first and second connecting means located inside the partition wall and cross-connecting the first and fourth fixed contacts and the second and third fixed contacts, respectively.

4,683,353

ROTARY SWITCH FOR INDUCTIVELY DRIVEN RAIL GUN SYSTEMS

Jiing-Liang Wu, Murrysville Boro; David W. Scherbarth, Wilkinsburg, and David Marschik, Wilkins Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1986, Ser. No. 848,369
Int. Cl.⁴ H01H *9/30, 19/56, 33/04, 33/06*
U.S. Cl. 200—8 R **23 Claims**

1. A switch for switching direct current comprising:

a rotor having a generally cylindrical conductive element;

said conductive element having first and second portions, wherein said first portion includes a continuously conductive external surface;

a pair of insulating members fixed at angularly spaced locations on said second portion such that sections of said conductive element and said insulating members alternate along a generally cylindrical surface of said second portion;

a first pair of angularly spaced retractable brush members

extending radially inward toward and axially along the conductive external surface of the first portion of the conductive element, for making sliding electrical contact with said first portion of the conductive element;

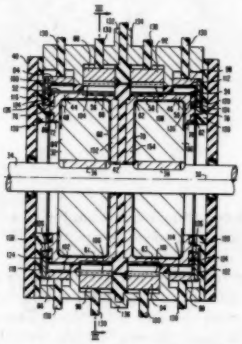
a second pair of angularly spaced retractable brush members extending radially inward toward and axially along the generally cylindrical surface of the second portion of the conductive element;

means for electrically connecting a first one of said first pair of brush members and a first one of said second pair of brush members to an external circuit;

means for electrically connecting a second one of said first pair of brush members to a second one of said second pair of brush members;

a switch housing encircling said rotor;

means for rotating the rotor with respect to said housing;



means for moving each of said brush members from a first portion, wherein the brush members do not make electrical contact with said conductive element, to a second position, wherein the brush members make electrical contact with said conductive element; and

said second pair of brush members and said conductive element being so dimensioned and positioned such that with said rotor in a first position, applied current flows from said first one of said second pair of brush members through said conductive element to said second one of said second pair of brush members, and with said rotor rotated to a second position, said conductive element no longer makes contact with both of said second pair of brush members, thereby interrupting the flow of current between the brush members of said second pair of brush members.

4,683,354

APPARATUS FOR SUPPORTING AND ALIGNING EQUIPMENT

Samuel J. Phillips, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 28, 1985, Ser. No. 750,331

Int. Cl.[4] H01H *3/16*

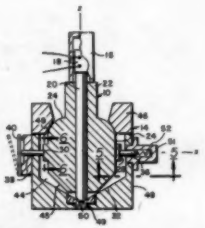
U.S. Cl. 200—61.41 **4 Claims**

1. Means for supporting and aligning equipment in a three axes cartesian coordinate system comprising:

a stator, supported upon its top end and having a downwardly biased extendible centering pintle positioned for axial movement along a substantially vertical z axis, an indexing-pintle-receiving detent groove on the outer side surface thereof and substantially parallel to but offset from said z axis, and a spherically-zonal-shaped supporting-surface symmetrical about said first axis proximal to said supported top end;

said stator having a pair of substantially horizontal perpendicular axes, x and y, defining an orthogonal set of axes with said z axis, said x axis intersecting substantially the center of said indexing-pintle-receiving detent groove;

a rotor, forming a cavity surrounding said stator, said cavity having an inner surface supported by but free to slide on said spherically-zonal-shaped supporting-surface to support said rotor, a centering-pintle-receiving detent in the bottom surface of said cavity for engaging said centering pintle to align said rotor with said z axis, a cammed guiding surface on the bottom surface of said cavity adjacent said centering-pintle-receiving detent for guiding said



centering pintle into said centering-pintle-receiving detent, and an inwardly-biased indexing pintle positioned for sliding movement relative to said rotor, on an axis perpendicular to the axis defined by said centering-pintle-receiving detent, to engage said indexing-pintle-receiving detent groove on said stator to hold the alignment of said indexing pintle with said x axis and said rotor about said z axis.

4,683,355

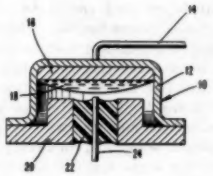
POSITION INSENSITIVE SHOCK SENSOR

Sheldon S. Bitko, East Brunswick, N.J., assignor to Fifth Dimension Inc., Trenton, N.J.

Filed Dec. 9, 1986, Ser. No. 939,725

Int. Cl.[4] H01H *1/08, 29/00, 35/14*

U.S. Cl. 200—61.47 **27 Claims**



1. A shock sensor for sensing shock directed in a given direction, comprising:

a housing containing a volume of an electrically conductive liquid and having an interior surface that is not wettable thereby;

a rigid insert arranged within the housing, said insert presenting a support surface wetted by said electrically conductive liquid;

a first contact terminal in electrical communication with said insert;

a second contact terminal electrically insulated from said insert and arranged within the housing adjacent the volume of electrically conductive liquid supported by said insert;

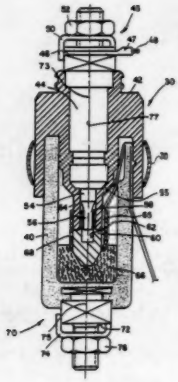
said volume of electrically conductive liquid and the area of said wetted support surface being such that said electrically conductive liquid, while wetted to said support surface, moves into electrical contact with said second contact terminal in response to shocks and is thereafter restored.

4,683,356

TAUT WIRE FENCE SYSTEM AND SENSOR THEREFOR

Arie Stoler, Holon, Israel, assignor to Israel Aircraft Industries Ltd., Israel

Continuation of Ser. No. 658,883, Oct. 9, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,431
Claims priority, application Israel, Oct. 10, 1983, 69945
Int. Cl.[4] A01K 3/00; G08B 13/00; H01H 3/02
U.S. Cl. 200—61.93 13 Claims



1. A sensor for a taut wire fence comprising a plurality of generally parallel taut wires, which sensor comprises:

a first terminal at one longitudinal end of the sensor comprising a first clamp connector for allowing rigid attachment thereto of a first taut wire, and a second terminal at the opposite longitudinal end of the sensor comprising a second clamp connector for allowing rigid attachment thereto of a second taut wire, each of said first and second taut wire attachment terminals being rigidly attached to a respective first and second sensor housing portion, said sensor housing portions lying on respective longitudinal axes which ar collinear with each other and with said longitudinal sensor ends in a rest position of said first and second taut wires, said first sensor housing portion being mounted onto said second housing portion so as to enable relative motion therebetween by skewing between their respective longitudinal axes;

means located on the sensor between said longitudinal sensor ends for mounting it in pivotal fashion on an upright rigid support such that the sensor as a whole is pivotable substantially only in the plane defined by the taut wires attached thereto; and

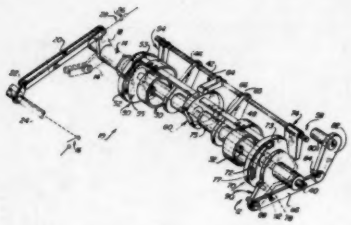
first and second electrical contacts each disposed within a respective one of said sensor housing portions, at least one of said first and second electrical contacts being electrically insulated from said first and second attachment terminals, each of said respective electrical contacts being movable in response to a pivoting movement of said sensor imposed by a predetermined dislocation from said rest position of either of said first or second taut wires acting through a respective one of the first and second attachment terminals, the disposition of said contacts within said respective sensor housing portions being such that a predetermined relative motion between said first and second attachment terminals produces an electrical connection between said first and second electrical contacts.

4,683,357

SWITCH-OPERATING MECHANISM WITH IMPROVED CHARGING ARRANGEMENT

John C. Opfer, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Dec. 19, 1985, Ser. No. 810,796
Int. Cl.[4] H01H 3/30
U.S. Cl. 200—153 SC 10 Claims



1. An operating mechanism for a switch comprising:

an operating member movable in switch-opening and switch-closing directions;

a first selectively releasable latch for preventing movement of said operating member in said switch-closing direction;

a control member movable in first and second opposed directions between first and second positions;

a closing spring which acts between said operating member and said control member so that switch-closing energy is stored in said closing spring by movement of said control member in said first direction from said first position to said second position while said first latch prevents switch-closing movement of said operating member;

a second selectively releasable latch for preventing movement of said control member in the second direction whenever said control member has moved to the second position to store switch-closing energy in said closing spring;

a charging member movable in said first and second directions and including means for moving said control member in said first direction from said first position to said second position when said charging member is moved in said first direction;

an opening spring which acts between said control member and said charging member so that switch-opening energy is stored in said opening spring by movement of said charging member in said second direction while said second latch prevents movement of said control member in said second direction;

a third latch for preventing movement of said charging member in said first direction after said opening spring is charged with switch-opening energy; and

means for moving said operating member in the switch-opening direction in response to movement of said control member from said second position to said first position,

whereby movement of said charging member in said first direction followed by movement of said charging member in said second direction sequentially charges said closing and opening springs with switch-closing and switch-opening energy respectively, said operating member moving in the switch-closing direction in response to release of said first latch, subsequent release of said second latch allowing said operating member to be moved in the switch-opening direction.

4,683,358

CONTACT ARRANGEMENT IN A RELAY FOR HIGH BREAKING CAPACITY

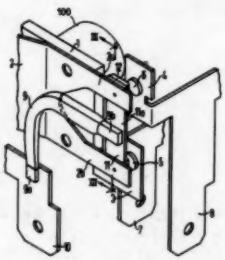
Michael Dittmann, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,226

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 8506345[U]

Int. Cl.[4] H01H *1/20*

U.S. Cl. 200—243 **9 Claims**



1. A contact arrangement in a relay for high breaking current capacity, comprising:

a movable one-piece contact spring split in fork-like fashion into two integral fork ends at its free end;

each of said fork ends being opposite a fixed, stationary cooperating contact element at at least one side;

said two fork ends being connected to one another via a contact strip of material having relatively good electrical conductivity compared to the contact spring;

said contact strip having contact regions positioned near its opposite ends adjacent the fixed contact elements for electrical contact therewith and said contact strip extending perpendicular to a longitudinal extend of the fork ends of said contact spring and lying free and away from portions of the contact spring in a region between said fork end; and

a flexible current carrying conductor connected at one end to said contact strip.

4,683,359

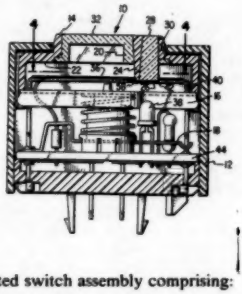
ILLUMINATED SWITCH ASSEMBLY WITH COMBINED LIGHT AND LIGHT SHIELD

Guy A. Wojtanek, Franklin Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 13, 1986, Ser. No. 839,239

Int. Cl.[4] H01H *9/18*

U.S. Cl. 200—314 **2 Claims**



1. An illuminated switch assembly comprising:

a switch;

a switch actuator operative upon movement by an operator to activate said switch with a display panel having a generally planar display surface, the display surface having a first region of graphic indicia adapted to be illuminated by a first source from one side thereof away from the operator to display the function controlled by the switch and a second region adapted to be illuminated by a second source from said one side away from the operator to indicate actuation of said switch, said actuator being formed with a wall separating said first and second regions and extending away from the display surface in a direction substantially transverse thereto;

means defining a first support surface underlying said display panel in close proximity to said display surface, said first support surface being formed with an opening to allow said wall to extend therethrough;

an electroluminescent panel mounted on said first support surface underlying said first region but not said second region of said display surface and operative as said first source of illumination, said electroluminescent panel being formed as a sandwich comprising plural layers with a layer having areas of electroluminescent phosphor and electrical conductors thereon and disposed between supporting transparant layers;

means defining a second support surface underlying said first support surface;

a lamp mounted on said second support surface and disposed to underly the opening of said first support surface and operative as said second source of illumination; and,

shield means operative to prevent said lamp from illuminating said first region and including a coating of opaque material on the layer of said electroluminescent panel adjacent said first support surface and adjacent said opening, said opaque material extending along said layer a sufficient distance such that light from said lamp cannot leak through the coated layer to said first region of graphic indicia.

4,683,360

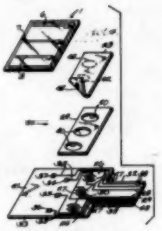
MEMBRANE SWITCH COMBINED WITH ELECTROLUMINESCENT LAMP PANEL

Thomas L. Maser, Mequon, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed May 9, 1986, Ser. No. 861,485

Int. Cl.[4] H01H *9/16*

U.S. Cl. 200—314 **5 Claims**



1. A membrane switch-electroluminescent lamp panel assembly comprising, in combination:

(1) a membrane switch comprising a first circuit layer and a second circuit layer spaced from one another, a conductive circuit including at least one contact on a surface of the first circuit layer and a conductive circuit including at least one contact on a surface of the second circuit layer, the circuit layers being arranged with their surface carrying the conductive circuits facing one another, conductive tracks leading from the conductive circuit on at least one of said circuit layers to the end of a tail portion extending from such circuit layer, said conductive circuits forming a

membrane switch with at least one switch cell comprising spaced contacts;

(2) an electroluminescent lamp panel including spaced transparent and base electrodes with dielectric and phosphorescent layers therebetween surrounded by an envelope of insulating plastic, a conductive lead from each transparent electrode of the lamp panel arranged along a surface of the envelope and a conductive lead from the base electrode of the lamp panel arranged along a surface of the envelope; and wherein

(3) the electroluminescent lamp panel is attached to the first circuit layer or the second circuit layer with each conductive lead of the electroluminescent lamp panel electrically connected to a conductive pad on the circuit layer, and a conductive track on such circuit layer leading from each conductive pad to a tail portion for connection to electrical circuitry.

4,683,361

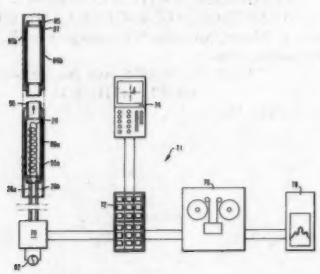
BRAZING APPARATUS HAVING A DUAL FUNCTION HEATING AND EDDY CURRENT PROBE COIL

John M. Driggers, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1985, Ser. No. 720,106

Int. Cl.[4] H05B *6/06*

U.S. Cl. 219—10.43 **28 Claims**



1. A process for using a heater assembly as an eddy current probe with an elongated, electrically conductive conduit in order to position the heater assembly adjacent to a selected section of the conduit prior to the heating thereof, wherein said heater assembly includes an electrical resistance heating element, comprising the steps of:

(a) conducting an alternating current having a frequency of between about 10 to 10,000 kHz through the electrical resistance heating element in order to induce eddy currents in the conduit;

(b) moving the heater assembly along the longitudinal axis of the conduit while monitoring changes in the impedance of the electrical resistance heating element in order to properly position the heating element with respect to said conduit, and

(c) conducting a heat-producing current through said electrical heating element in order to generate and apply radiant heat onto said selected section.

4,683,362

REFLECTIVE APPARATUS FOR MICROWAVE COOKING

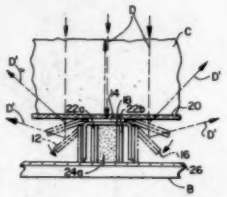
Roger A. Yangas, 14000 Citation Dr., Orland Park, Ill. 60642

Continuation-in-part of Ser. No. 652,897, Sep. 21, 1984, Pat. No. 4,539,454. This application Aug. 14, 1985, Ser. No. 765,374

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 F **8 Claims**



1. A reflective cell in combination with an oven for improving uniformity in the temperature of a food product heated in a radiant energy heating cavity of said oven, comprising:

A. an oven having a radiant energy heating cavity;

B. temperature sensor means responsive to heat generated within said cavity, said temperature sensor means including a bimetallic element, said bimetallic element having a U-shaped configuration including a pair of spaced, opposing arms, said arms being generally parallel in unheated condition of said bimetallic element, said arms being spreadable when said bimetallic element is heated and retractable when said bimetallic element is cooled;

C. movable reflection means for reflecting radiant energy within said cavity, said movable reflection means also being located in said cavity, said reflection means including a pair of reflective members engaging said respective arms and movable therewith; and

D. said reflection means being movable with variation in the response of said sensor means to said heat, in order to vary the direction of said reflecting radiant energy relative to said food product and to vary concentration of said reflecting radiant energy incident on said product for promoting said temperature uniformity therein.

4,683,363

MICROWAVE APPARATUS FOR PROCESSING SEMICONDUCTOR

Peter D. Scovell, Essex, England, assignor to ITT Industries Inc., New York, N.Y.

Continuation of Ser. No. 661,144, Nov. 15, 1984, abandoned, which is a division of Ser. No. 413,327, Aug. 31, 1982, Pat. No. 4,490,183. This application Jun. 18, 1986, Ser. No. 876,306

Claims priority, application United Kingdom, Sep. 17, 1981, 8128127

Int. Cl.[4] H05B *6/80*

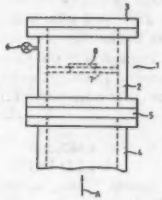
U.S. Cl. 219—10.55 A **9 Claims**

1. A semiconductor processing apparatus comprising:

a sealable chamber including a length of microwave waveguide and window means for the passage of microwaves into the chamber in the direction of the axis of the waveguide;

means for controlling the ambient atmosphere within the chamber, said controlling means maintaining said ambient atmosphere at elevated pressures;

semiconductor wafer support means mounted in the chamber and supporting a semiconductor wafer; and



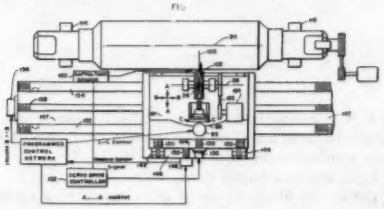
means for supplying pulses of microwave energy through said window means into said chamber to pulse heat said semiconductor wafer placed on said support means.

4,683,364

ELECTRICAL DISCHARGE SHAPE FORMING AND SURFACE CONDITIONING DEVICE

Alex L. Anderson, Rockford, Ill., assignor to Micro Surface Technology, Inc., Rockford, Ill.

Filed Oct. 7, 1985, Ser. No. 785,145
Int. Cl.[4] B23H *1/04, 7/26*
U.S. Cl. 219—69 R **8 Claims**



1. Improved apparatus for electric discharge machining the surface of an electrically conductive generally cylindrical workpiece wherein said workpiece is mounted for rotation about a longitudinal axis for cooperation with an electrode that moves over the surface and including means for directing a dielectric fluid flow in the gap between the electrode and workpiece, said electrode providing an electric discharge therefrom to the roll form surface to alter the surface condition into a desired form, said apparatus comprising, in combination:

a cylindrical electrode having a rotational axis;

means for mounting the electrode for rotation about the rotational axis, said means for mounting also including means for aligning the rotational axis generally parallel to the workpiece longitudinal axis, so as to maintain the cylindrical electrode surface generally parallel to an increment of the workpiece surface;

gap means for defining a gap between the electrode and the workpiece surface, said gap being located on a line generally perpendicular to the axes and connecting the axes;

means for providing electric current for discharge from the cylindrical electrode;

means for rotating the cylindrical electrode about its axis;

means for moving the cylindrical electrode transversely along the longitudinal axis;

said gap means including sensor means for detecting the magnitude of the gap, and means for adjusting the magnitude of said gap, said means for adjusting including platform means for supporting the electrode and means for moving the platform means in response to the sensor means toward or away from the surface; and

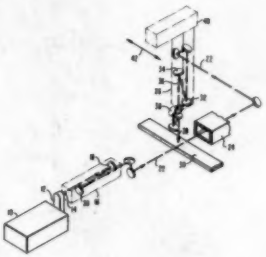
means for supporting the cylindrical workpiece, said means for supporting including a workpiece support station affixed to a workpiece platform, said station including first and second roller bearing members, each member mounted on a bracket, said brackets being pivotally mounted to accommodate the workpiece.

4,683,365

LASER BEAM TRANSPORT SYSTEM

William H. Kasner, Penn Hills Township, Allegheny County; Martin H. Cooper, Churchill Boro, both of Pa.; Clark E. Swenson, Orchard Park, N.Y.; Albert P. Ciez, Monroeville, and Katherine M. Andrews, Shadyside, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 26, 1986, Ser. No. 844,422
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **4 Claims**



1. A laser beam transport system for laser welding at a relatively remote welding station comprising:

a laser generator at one location relatively remote to said welding station producing a laser beam of a given diameter significantly under 0.13 meters;

means for expanding said beam closely adjacent said one location to about at least 0.13 meters diameter;

means for directing the expanded beam to a second location relatively closely adjacent said welding station;

means for reducing said expanded beam to a reduced diameter selected for the welding process and for directing said reduced diameter beam to said station; and

means for moving said beam reducing means and the reduced beam linearly along the length of said work station which has a high range in excess of 15 meters in length, whereby the reduced beam diameter is sufficiently constant to provide a uniform weld along the entire length of said work station.

4,683,366

ALL ELECTROSTATIC ELECTRON OPTICAL SUB-SYSTEM FOR VARIABLE ELECTRON BEAM SPOT SHAPING AND METHOD OF OPERATION

Kenneth J. Harte, Carlisle, and Guenther O. Langner, Westford, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 749,789
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 ER **14 Claims**

1. An all electrostatic charged particle beam variable spot-shaping lens and deflector assembly to be mounted within an elongated evacuated housing along the optical axis of the undeflected charged particle beam path of a charged particle beam produced by a charged particle gun mounted at one end of the elongated housing;

said electrostatic charged particle beam spot shaping lens and deflector assembly including first and second spot shaping apertured plate members spaced apart a predetermined axial distance along the optical axis of the assembly and having spot shaping apertures formed therein, first and second electrostatic spot shaping lens sub-assemblies

mounted between the first and second spot shaping apertured plate members along the optical axis of the assembly housing and spaced-apart a predetermined distance with relation to each other and the apertured plate members, and first and second spot shaping electrostatic deflector means mounted along the optical axis of the assembly with the first spot-shaping deflector means interposed between the first and second spot shaping electrostatic lenses for imaging the aperture of the first spot shaping apertured plate member onto the second spot shaping apertured

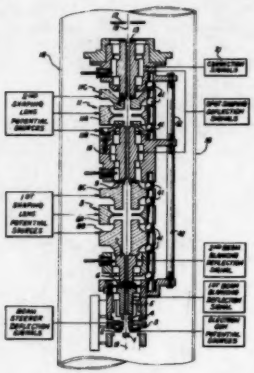


plate member to thereby produce a partially truncated image of the first spot shaping aperture for application to a target surface, and said second spot-shaping electrostatic deflector means being mounted immediately following the second spot-shaping apertured plate member in the direction of the charged particle beam path for restoring the partially truncated charged particle beam image of the first spot shaping aperture back to the optical axis of the undeflected beam to thereby avoid the need to correct the beam spot position at the target plane as the charged particle beam shape is varied.

4,683,367

METHOD AND DEVICE FOR CONTROLLING THE EROSION OF THE ELECTRODES OF A PLASMA TORCH

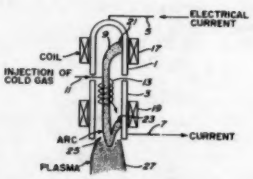
Michel G. Drouet, St-Bruno, Canada, assignor to Hydro-Quebec, Quebec, Canada

Continuation of Ser. No. 751,573, Jul. 3, 1985, abandoned. This application Apr. 18, 1986, Ser. No. 854,677

Claims priority, application Canada, Jun. 7, 1985, 483451

Int. Cl.[4] B23K *15/00, 9/00*

U.S. Cl. 219—121 PY **8 Claims**



1. Method for controlling the erosion of the electrodes of a plasma torch, in which an electric arc is produced when the electrodes are connected to an electrical supply, gases are introduced in said electrodes tangentially relative to said arc, an axial magnetic field generated by a system of field coils causing the rotation of the extremities of the arc along a circular trajectory inside the electrodes, which comprises providing at least two field coils for each electrode, continuously modulating the value of the current in at least one of the coils so as to axially modify the position of the minimum of the sum of the two fields produced by the two coils, positioning said field coils so as to produce said minimum on the surface of the electrode, allowing the extremity of said arc to run along the surface of the electrode where the value of the magnetic field presents said minimum, thereby causing a unidirectional displacement of the circular trajectory of the extremity of the arc.

4,683,368

WELD ROD

K. Bhagwan Das, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 743,175, Jun. 10, 1985, which is a continuation-in-part of Ser. No. 473,718, Mar. 8, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,458

Int. Cl.[4] B23K *35/22*

U.S. Cl. 219—146.1 **10 Claims**

1. A consumable weld rod suitable for use in arc welding fiber reinforced metal matrix composites to form welds having fiber reinforcement, consisting essentially of:

(a) a sheath of matrix metal having a bore;

(b) a core filling the bore and comprising a mixture of a powdered matrix metal that is identical to or compatible with the metal of the sheath and reinforcing fibers having an aspect ratio of between about 20:1 to 200:1.

4,683,369

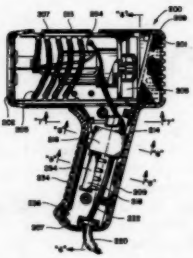
HAND HELD ELECTRIC HAIR DRYER

Roger A. Rieckman, Elmhurst; William R. Hemrich, Glen Ellyn; Donald N. Jursich, Chicago, all of Ill., and George C. Crowley, Pinehurst, N.C., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 5, 1986, Ser. No. 826,178

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—364 **17 Claims**



1. A portable electric hair dryer comprising a housing of electrically insulating material having air inlet and outlet openings, a motor driven fan mounted within said housing for drawing air into said housing through said inlet opening and

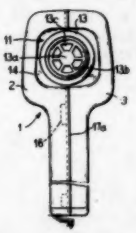
for exhausting said air through said outlet opening, a resistance heater mounted in said housing and located in the stream of air circulated into and out of said housing by said fan, a two conductor electrical power cord connected at one end to said housing to supply electricity to said motor and said heater and having a plug connector at the other end, a normally open double pole switch mounted on said housing and connected to said power cord and said motor and said heater to control the flow of power to said motor and said heater, said double pole switch being completely sealed against the entrance of water if the hair dryer is immersed in water, said power cord having a water impermeable sheath extending from said plug connector to the entrance of said power cord into said switch whereby all of the electrically energized parts of said hair dryer are sealed against contact with water in the event of the hair dryer being immersed in water when said power cord is connected to a source of electrical power.

4,683,370

HOT AIR GUN WITH AIR DIRECTING HOUSING

Walter J. Petersen, Eden Prairie, and John M. Svendsen, New Hope, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapokis, Minn.

Filed Aug. 8, 1984, Ser. No. 639,663
Int. Cl.[4] H05B *3/00*; F24H *3/04*; A45D *20/10*
U.S. Cl. 219—370 **26 Claims**



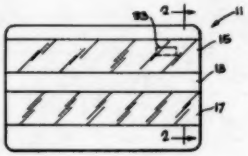
1. A hand-held hot air gun comprising:
a housing having an air inlet means for admitting fresh air into said housing;
a motor supported in a motor mount in said housing, said motor having an impeller for drawing air into said housing through said inlet means;
a shroud in said housing surrounding said impeller for receiving air drawn in by said impeller and having an air inlet and an air outlet;
a heater unit in said housing having a first end forming an inlet communicating with the outlet of said shroud for receiving and heating air therefrom and a second end defining an air outlet from which heated air is discharged out of said housing; and
air directing means including a plurality of brackets integrally formed on an interior of said housing including front brackets supporting and retaining said first end of said heating unit, in spaced relation to the interior surface of said housing, and rear brackets supporting and retaining said motor mount located a predetermined distance away from said front brackets on the side of said front brackets opposite said heater unit with said shroud being press fit between said heating unit and said motor mount in sealed relation therewith, said plurality of brackets defining a plurality of air passages in said housing in cooperation with respective exterior surfaces of said shroud and heater unit communicating said housing air inlet means with said shroud air inlet, at least one of said air passages being adjacent said exterior surface of said heater unit for preheating air flowing through said at least one of said air passages.

4,683,371

DUAL STRIPE OPTICAL DATA CARD

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 673,573, Nov. 21, 1984, Pat. No. 4,542,288, which is a continuation-in-part of Ser. No. 566,966, Dec. 29, 1983, Pat. No. 4,500,777, which is a continuation-in-part of Ser. No. 492,691, May 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,027
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[4] G06K *19/00*
U.S. Cl. 235—487 **4 Claims**



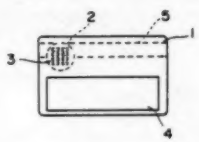
1. An optical data card comprising,
a card substrate having opposed sides and a length equal to or exceeding a width,
a first strip of erasable optical recording material affixed to said card substrate, said first strip being in-situ laser recordable and being substantially blank, and
a second strip of optical data storage material affixed to said card substrate, said second strip having pre-recorded programs or data thereon.

4,683,372

IC CARD SYSTEM

Hiromichi Matsumoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 25, 1985, Ser. No. 705,184
Claims priority, application Japan, Feb. 25, 1984, 59-33845
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—492 **2 Claims**



1. An integrated circuit card system comprising:
a card comprising:
an integrated circuit supported on said card and comprising a data memory area divided into a plurality of memory regions, each of said regions corresponding to a respective type of data terminal which is capable of accessing it, and processing means for enabling a particular memory region to be accessed by a data terminal when received identification data from said data terminal indicates that said data terminal has access to said particular memory region, said processing means denying said data terminal access to other memory regions; and,
means for connecting said integrated circuit with said data terminal; and,
a data terminal comprising:
a card input means for receiving said card and transmit-

ting data to and receiving data from said integrated circuit, and,

means for providing said terminal identification data to said integrated circuit.

4,683,373

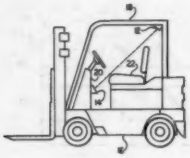
OPTICAL SEAT SWITCH

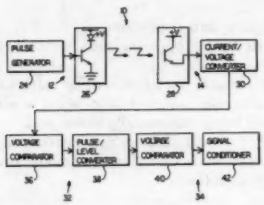
David J. Tupman, Mentor, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Continuation of Ser. No. 773,142, Sep. 5, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 921,892

Int. Cl.[4] H01J *40/14*; B60K *28/04*

U.S. Cl. 250—221 **8 Claims**





1. Apparatus for producing a control signal in response to the presence and absence of an occupant in the seat of a vehicle, comprising:

emitting means for directing a source of coded radiant energy across said vehicle seat;

detecting means for receiving radiant energy, including a portion of said coded radiant energy in response to said seat being vacant, and producing an electrical signal in response to said received radiant energy;

discriminating means for distinguishing said electrical signal produced in response to said detecting means receiving said coded radiant energy, from electrical signals produced in response to said detecting means receiving spurious uncoded radiant energy; and

circuit means for producing said control signal only in response to said detecting means receiving said coded radiant energy.

4,683,374

METHOD AND MEANS FOR MULTIPLEXING OPTICAL SENSORS

Edward L. Weiss, Milford Township, Pike County, Pa., assignor to General Signal Corporation, Stamford, Conn.

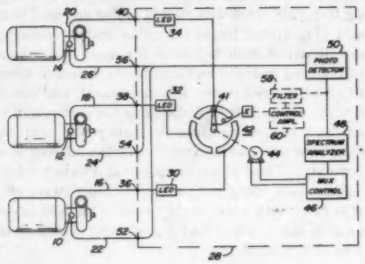
Filed Aug. 7, 1985, Ser. No. 763,156

Int. Cl.[4] G02F *1/00, 2/00*

U.S. Cl. 250—227 **3 Claims**

1. A method for multiplexing the signals of several optical sensors of the type which utilize a single light input optical fiber for each sensor to send light to said sensors from a central monitoring station and a single signal output optical fiber for each sensor to communicate the light output of the sensors back to a single receiver in said monitoring station, which comprises the step of:

sequentially introducing a predetermined amount of light flux into selected ones of said light input optical fibers to activate the associated sensors to produce signal outputs



indicative of the magnitude of the quantities being measured for communication to said receiver.

4,683,375

APPARATUS FOR DETECTING A STEERING ANGLE AND A STEERING ANGULAR VELOCITY

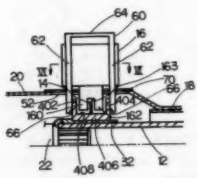
Shigeru Hoshino, and Hiroshi Miyata, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha

Continuation of Ser. No. 574,353, Jan. 27, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,438

Claims priority, application Japan, Jan. 29, 1983, 58-11959[U]

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **10 Claims**



6. An apparatus for detecting a steering angle and an angular velocity of a rotating member, comprising:

a holder member circumferentially secured onto an outer peripheral portion of the rotating member, the holder member including a first radial projection and a second radial projection with a first interval defined therebetween;

a disc mounted on and rotatable with the holder member, the disc having a plurality of holes therein located at equal radial distances from the center of the disc, the disc being centrally located between the first and second radial projections of the holder member, whereby a lower half interval is defined between the first radial projection and the disc and an upper half interval is defined between the second radial projection and the disc;

a tube for rotatably mounting the rotating member therein, wherein the tube does not rotate with the rotating member;

a lower tube secured to a lower end of the tube;

a sensor detachably mounted and slidable on the lower tube and having a first extending portion housing a luminescent means and a second extending portion housing a light receiving means axially aligned through the disc, the first and second extending portions being inserted respectively into the lower and upper half intervals, and

a jig detachably mounted on said sensor, the jig having a first contacting leg and a second contacting leg, the first and second contacting legs extending to the holder member,

the first contacting leg being in contact with the first radial projection of said holder member, the second contacting leg being in contact with the second radial projection of said holder member, whereby the first and second contacting legs of said jig adjust and maintain clearances between the first and second radial projections of said holder member, the first and second extending portions of the sensor and the disc, and said disc is prevented from coming in contact with said first or second extending portions.

4,683,376

OPPOSING FIELD SPECTROMETER FOR ELECTRON BEAM MENSURATION TECHNOLOGY

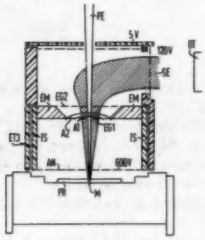
Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to ICT Integrated Circuit Testing Gesellschaft, fuer Halbleiterprüftechnik mbH, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 773,863

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434231

Int. Cl.[4] G01N *23/00*

U.S. Cl. 250—309 **11 Claims**



1. An electrostatic opposing field spectrometer having a primary beam for generating secondary particles when focused on a specimen, comprising:

an extraction electrode and

an opposing field electrode arrangement wherein said opposing field electrode arrangement includes at least one essentially planar opposing field electrode, and

wherein said opposing field electrode arrangement, so as to accommodate the angular distribution of secondary particles, includes

an outer electrode part arranged at the edge of said at least one essentially planar opposing field electrode, said outer electrode part has an inside wall at the edge of said at least one essentially planar opposing field electrode wherein said inside wall is closer to the primary beam at a portion toward said extraction electrode and spaced farther from the primary beam at a portion away from said extraction electrode.

4,683,377

SUBTRACTION PROCESSING METHOD AND APPARATUS FOR RADIATION IMAGES

Kazuhiro Hishinuma, and Akihiro Ohga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 5, 1983, Ser. No. 511,026

Claims priority, application Japan, Jul. 5, 1982, 57-116457

Int. Cl.[4] G03C *5/16*

U.S. Cl. 250—327.2 **8 Claims**

1. A subtraction processing method for radiation images including the steps of recording two or more radiation images on separate stimulable phosphor sheets, at least a part of image information being different among said radiation images, scanning the respective stimulable phosphor sheets with stimulating rays to sequentially release the radiation energy stored in the stimulable phosphor sheets as light emission, photoelectrically detecting the emitted light by a light detecting means to obtain digital image signals of the respective radiation images, and extracting an image of a specific structure contained in at least one of said radiation images by conducting a subtraction processing among said digital image signals, the subtraction processing method for radiation images comprising;

(i) when each radiation image to be subtraction processed is recorded on each stimulable phosphor sheet, simultaneously recording a marker having such a shape as provides a reference point or a reference line to said stimulable phosphor sheet in a position fixed with respect to said radiation image,

(ii) scanning said stimulable phosphor sheet carrying said radiation image stored therein with stimulating rays, and detecting the spatial coordinate of said reference point or said reference line of said marker detected from the light emitted from said stimulable phosphor sheet,

(iii) moving said stimulable phosphor sheet with respect to scanning lines of stimulating rays based on said detected spatial coordinate and adjusting the position of said spatial coordinate to a spatial coordinate predetermined with respect to said scanning lines of stimulating rays, and thereafter,

(iv) reading out said radiation image.

4,683,378

APPARATUS FOR ION BEAM WORK

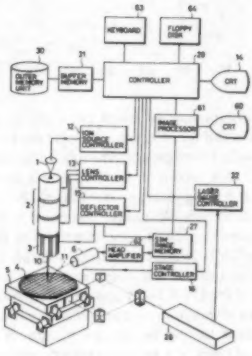
Akira Shimase, Yokohama; Hiroshi Yamaguchi, Fujisawa; Satoshi Haraichi, and Tateoki Miyauchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 754,930

Claims priority, application Japan, Jul. 13, 1984, 59-144478

Int. Cl.[4] H01J *37/304, 37/302*

U.S. Cl. 250—492.2 **8 Claims**



1. An ion beam work apparatus comprising: ion beam radiation means for focusing and radiating an ion beam extracted from an ion beam source on a target placed on a moving mechanism, and scanning two-dimensionally the ion beam radiation position;

secondary particle detection means for detecting secondary

particles generated from a surface of said target by radiation of said ion beam, and forming a secondary particle image from the detection signals;

display means fopr superposing a display of said secondary particle image near a processing area formed by said secondary particles with a different image having position information not obtained from said secondary particle image and indicating a wiring layer of said target near the processing area, said different image including at least one of an optical microscope image and an image derived from an optical microscope image;

first means for detecting a relative deviation of reference points for each of said secondary particle image and said different image, and for moving at least one of said images with respect to the other of said images so that the relative deviation is minimized;

second means for setting the processing area of said target based on the position information of said different image as adjusted by said first means; and

third means for processing a portion of the wiring layer of said target by radiating the ion beam from said ion beam radiation means on the processing area set by the second means;

4,683,379

LAMP FOR EMISSION OF RADIATION IN UV AND VISIBLE LIGHT RANGES OF THE SPECTRUM

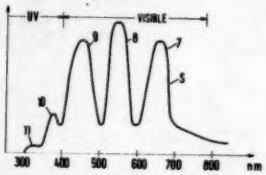
Friedrich Wolff, Störklingasse 38, CH-4125 Riehen/Basel, Switzerland

Filed Aug. 29, 1985, Ser. No. 770,723

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431692

Int. Cl.⁴ G21G *4/00*

U.S. Cl. 250—493.1 **15 Claims**



1. A lamp, comprising an envelope; a gas in said envelope discharge means and for effecting a discharge; and a mixture of substances in said envelope for emitting radiation in response to a discharge, said mixture including a first substance which emits radiation having energy maxima in the red, blue and green bands of the visible range, a second substance which emits radiation having an energy maximum in the long-wave Portion of the UVA band, and a third substance which emits radiation in a part of the UV range extending from the short-wave portion of the UVA band down to approximately 300 nm in the long-wave portion of the UVB band, the third substance's radiation having an energy maximum in the short-wave portion of the UVA band the energy maximum of radiation in the long-wave portion of the UVA band lying between 370 and 390 nm and being less pronounced than the energy maxima in the red, blue and green bands of the visible range, and the energy maximum of radiation in the short-wave portion of the UVA band being substantially less pronounced than the energy maximum in the long-wave portion of the UVA band.

4,683,380

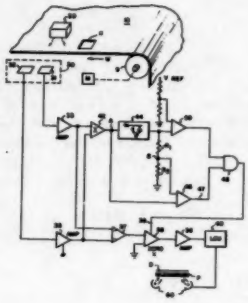
APPARATUS AND METHOD FOR DETECTING A PERFORATION ON A WEB

James P. Shipkowski, and Phillip W. Pearce, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1985, Ser. No. 795,563

Int. Cl.⁴ G01N *21/86*

U.S. Cl. 250—548 **8 Claims**



1. An electrophotographic reproduction apparatus comprising:

a photoconductive member movable along a path;

means for moving the member along the path;

means for performing an operation upon said apparatus in accordance with a timed sequence;

the member including an indicium for use in timing said sequence;

photoelectric sensing means for locating the indicium;

the sensing means including first and second photosensitive means and light generating means adapted to project a different amount of light onto the photosensitive means in accordance with the relative positioning of the indicium vis-a-vis the photosensitive means, the photosensitive means each providing a signal related to the amount of light falling thereon, the sensing means also including

(a). means for comparing the signals from the photosensitive means and when they are simultaneously equal, generating a third signal for performing said operation, and

(b). means for adding together the signals from the photosensitive means and for comparing a fourth signal representing the sum of said signals with a threshold signal and for inhibiting the transmission of the third signal when the fourth signal is les than the threshold signal.

4,683,381

CONTROLLED-ACCESS APPARATUS FOR THE AGRICULTURAL FOOD INDUSTRIES

Gilbert E. Dufoug, Paris, France, assignor to Ets. Bonnet, Sur Saone, France

Filed Oct. 4, 1984, Ser. No. 657,523

Claims priority, application France, Oct. 14, 1983, 83 16387

Int. Cl.⁴ H01H *47/00*

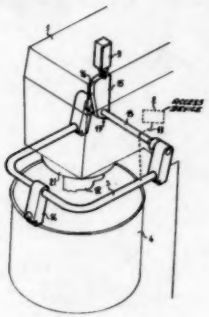
U.S. Cl. 307—125 **10 Claims**

1. A controlled-access apparatus for an agricultural food apparatus having a vessel with an opening and a tool-holder, comprising:

means provided within a space located between the tool-holder and an edge of the opening of the vessel of said apparatus, for detecting a characteristic of an object located in the vicinity of the detecting means, and producing a signal indicative thereof; and

protection means for selectively acting on the food apparatus allowing agricultural food products or ingredients, utensils and instruments located in the vicinity of the

detecting means and which produce impedance variations lower than predetermined limits to be located in the vicinity of said apparatus without acting on the operation of the apparatus, and shutting off the apparatus when objects



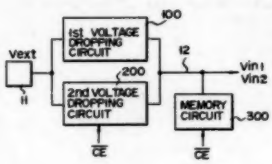
which produce impedance variations higher than said predefined limits are detected in the vicinity of the detecting means, said predefined limits chosen so that a member of a human body will shut off said apparatus.

4,683,382

POWER-SAVING VOLTAGE SUPPLY

Takayasu Sakurai, Tokyo, and Tetsuya Iizuka, Funabashi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 1, 1984, Ser. No. 667,417
Claims priority, application Japan, Feb. 22, 1984, 59-32068
Int. Cl.[4] H03K *3/01, 5/153;* **H01L** *9/02;* **G06G** *7/10*
U.S. Cl. 307—296 R **17 Claims**



1. A semiconductor device comprising:

an external power supply terminal to which an external power supply voltage is supplied;

an internal power supply line;

first voltage dropping means, connected between said external power supply terminal and said internal power supply line, operative in at least a standby interval, for generating a first voltage having a smaller value than that of the external power supply voltage to supply the first voltage to said internal power supply line; and

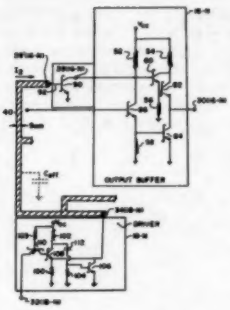
second voltage dropping means, connected between said external power supply terminal and said internal power supply line, operative in an interval other than the standby interval for generating a second voltage having a smaller value than that of the external power supply voltage to supply the second voltage to said internal power supply line.

4,683,383

DRIVER CIRCUIT FOR A THREE-STATE GATE ARRAY USING LOW DRIVING CURRENT

Hsienchin W. Wang, Milpitas, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jul. 19, 1984, Ser. No. 632,236
Int. Cl.[4] H03K *19/086, 17/26, 17/60*
U.S. Cl. 307—473 **20 Claims**



1. A driver circuit for simultaneously setting a plurality of output buffers of a three state gate array into and out of a floating third state, said driving circuit comprising:

a. a plurality of buffer driver transistors, one for each output buffer, with each buffer driver transistor having a primary current path coupled to a third state control input of a respective output buffer, and each buffer driver transistor further having a control electrode;

b. a first resistor;

c. a common driver transistor having a primary current path coupled to ground through said first resistor;

d. conductor means for connecting the junction of said common driver transistor primary current path and said first resistor to the control electrode of each of said buffer driver transistors;

e. clamp means for discharging said conductor means to ground upon turn-off of said common driver transistor, said clamp means including a clamp transistor having a primary current path coupled between said conductor means and ground and having a control electrode; said clamp means further comprising differentiator means, coupled to said common driver transistor, and to said control electrode of said clamp transistor, for detecting and responding to the leading edge of a signal at a node coupling said differentiator means to said common driver transistor, indicative of said turn-off of said common driver transistor, to momentarily turn ON said clamp transistor and thereby rapidly clamp said conductor means to ground.

4,683,384

INTEGRATED CIRCUIT HAVING INPUT AND OUTPUT DRIVERS CASCADED BETWEEN I/O PADS AND INTERNAL CIRCUITRY

Manabu Shibata, and Akira Uragami, both of Takasaki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,216
Claims priority, application Japan, Aug. 9, 1985, 60-174133
Int. Cl.[4] H03K *17/693, 19/094*
U.S. Cl. 307—475 **14 Claims**

1. An integrated circuit comprising:

(1) a substrate having one main surface;

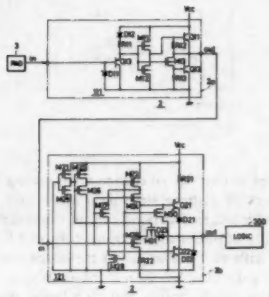
(2) a plurality of external connection pads formed on said main surface;

(3) a plurality of input circuits and a plurality of output circuits formed on said main surface in such a manner as to

form pairs that each correspond respectively to one of a plurality of said external connection pads; and

(4) an internal circuit disposed on said main surface in such a manner as to receive at input terminals thereof the output signals of a plurality of said input circuits and to generate at output terminals thereof the output signals that drive the inputs of a plurality of said output circuits,

wherein each of said input circuits includes an input and an output and elements which can be connected to provide a predetermined signal transmission path between the input and the output to provide a predetermined signal transmission function for said input circuit, wherein each of said output circuits includes an input and an output and elements which can be connected to provide a predetermined signal transmission path between the input and output to provide a predetermined signal transmission



function for said output circuit, and wherein the predetermined signal transmission path between the input and output of said input circuit formed so as to correspond to at least one of said external connection pads and at least part of the predetermined signal transmission path between the input and output of said output circuit formed so as to correspond to said one external connection pad are connected in series between said one external connection pad and one of the input terminals of said internal circuit so that the output signal of said output circuit responds to the input signal applied to said one external connection pad in a signal transmission relation determined by the predetermined signal transmission function of said input circuit and the predetermined signal transmission function of said output circuit, and is applied to said internal circuit.

4,683,385

PULSE NUMBER DETECTION CIRCUIT

Takashi Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

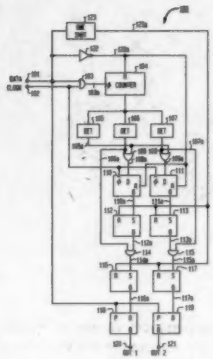
Filed Jan. 2, 1985, Ser. No. 688,370

Claims priority, application Japan, Jan. 4, 1984, 59-162

Int. Cl.[4] H03K *5/22*; G01R *19/145*

U.S. Cl. 307—518 **6 Claims**

1. A circuit comprising a first input terminal receiving an input data signal, a second input terminal receiving clock pulses, gate means coupled to said first and second input terminals for transmitting said clock pulses during a period of one logic level of said input data signal, a counter coupled to said gate means for counting the pulses transmitted by said gate means, said counter changing a count value in synchronism with one of a rising and a falling edge of each pulse supplied thereto and generating an output signal representative of its count value, a first detector coupled to said counter and generating a first signal only during a period of time when said counter takes a starting value, a second detector coupled to said counter and generating a second signal only during a period of time when said counter takes a count value of A that is a positive integer other than said starting value, first signal-producing means coupled to said second input terminal and to said first and second detectors for producing a third signal in response to the other of the rising and the falling edge of one of said clock pulses during a period of time when at least one of said first and second signals is generated, a first output



terminal, and first output means coupled to said first output terminal, said second detector and said first signal-producing means for producing a first output signal at said first output terminal when both of said second and third signals are generated, whereby said first output signal represents that said period of said one logic level of said input data signal is longer than a period of time equal to A-½ cycles of said clock pulses.

4,683,386

ELECTRONIC ATTENUATION VALUE CONTROL CIRCUIT IN WHICH SWITCHING NOISE IS SUPPRESSED

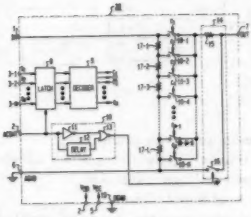
Toshio Kamikawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,693

Claims priority, application Japan, Jul. 26, 1983, 58-136102

Int. Cl.[4] H03K *17/16, 17/693*; H03H *7/24*

U.S. Cl. 307—549 **10 Claims**



1. A circuit comprising an input terminal supplied with an input signal, a reference terminal supplied with a reference potential, a plurality of resistors connected in series between said input terminal and said reference terminal, a plurality of first electronic switches each having one end connected to a different one of the connection points among said resistors, the other ends of said first electronic switches being connected in common, a control circuit for making one of said first electronic switches conductive, an output terminal, means for coupling the common connection point of said first electronic switches to said output terminal, a second electronic switch coupled between said output terminal and said reference termi-

nal, and means for controlling said second electronic switch to turn said second electronic switch on when one of said first electronic switches is changed from the conductive state to the non-conductive state while another of said first electronic switches is, in turn, changed from the nonconductive state to the conductive state.

4,683,387

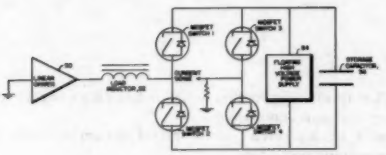
QUADRATURE SWITCH APPARATUS FOR MULTI MODE PHASE SHIFT DRIVERS

Franklin B. Jones, Baltimore; Walter E. Milberger, Severna Park, and Charles S. Kerfoot, Pasadena, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 3, 1985, Ser. No. 804,194

Int. Cl.[4] **H03K** *17/687, 19/16;* **H01J** *29/70*

U.S. Cl. 307—571 **4 Claims**



1. A quadrature switch apparatus for multi-mode phase shift drivers comprising in combination:

an impedance means,

a linear driver means operatively connected to one end of said impedance means, said linear driver means applying a linear drive signal to said impedance means,

a switch means operatively connected to the other end of said impedance means, said switching means to provide high speed bi-directional high voltage random mode switching, said switch means including a switchable ground reference, said switch means comprises a first and second MOSFET switch means in series and a third and fourth MOSFET switch means in series, said first and second MOSFET switch means is in parallel with said third and fourth MOSFET switch means, a first junction between said first and second switch means operatively connected to said impedance means, a second junction between said third and fourth MOSFET switch means operatively connected to ground, a third junction between said first and third MOSFET switch means operatively connected to one side of said high voltage power supply means, a fourth junction between said second and fourth MOSFET means operatively connected to the other side of said high voltage power supply means, and,

a high voltage power supply means operatively connected to said switch means, said high voltage power supply means being floating with respect to said ground reference, said high voltage power supply means being switchably connected to said impedance means to provide a bi-directional high voltage reset signal to said impedance means.

4,683,388

COMPOUND INDUCTION ELECTRIC ROTATING MACHINE

Dominc De Cesare, 223 Center St., Elizabeth, N.J. 07202

Continuation-in-part of Ser. No. 209,646, Nov. 24, 1980, Pat. No. 4,441,043, and a continuation-in-part of Ser. No. 438,905, Nov. 1, 1982, Pat. No. 4,581,554. This application Apr. 2, 1984, Ser. No. 595,729

Int. Cl.[4] **H02K** *37/00*

U.S. Cl. 310—46 **11 Claims**

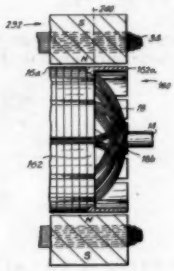
1. A dynamoelectric machine comprising:

a frame;

a rotatable shaft supported by said frame;

a cylindrical rotor mounted coaxially on said shaft defining two axial end surfaces each substantially in a plane normal to said shaft and a cylindrical circumferential surface coaxial with said shaft between said axial end surfaces, said rotor being provided with a plurality of rotor coil winding grooves which are generally parallel to said shaft and substantially uniformly spaced from each other about said circumferential surface to define a predetermined number of magnetic poles;

a distributed armature winding having axial portions parallel to said shaft and received within said rotor grooves and radial portions in the region of said end surfaces and extending between substantially diametrically opposite grooves with respect to said shaft; said winding radial portions at each axial end surface of said rotor creating a build-up of overlapping windings which is minimum at said circumferential surface and gradually increases to a



maximum in the region of said shaft, said build-up generally defining a conical convex surface;

magnetic field producing means mounted on said frame in proximity to said rotor cylindrical circumferential surface and extending axially beyond at least one of said rotor axial end surfaces; and

a plurality of rotor extensions projecting axially at said at least one of said rotor axial end surfaces to thereby position said rotor extensions and said portion of said magnetic field producing means in proximity and in magnetic coupling relationship to one another and said extensions at least partially axially overlapping said build-up of winding radial portions, whereby magnetic fields coupled into said rotor extensions by said magnetic field producing means is induced into said cylindrical rotor and to both said axial and radial portions of said distributed armature.

4,683,389

OIL SCAVENGE SYSTEM

John Readman, and Timothy J. Bland, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1985, Ser. No. 812,188

Int. Cl.[4] **H02K** *7/08;* **F01M** *1/12*

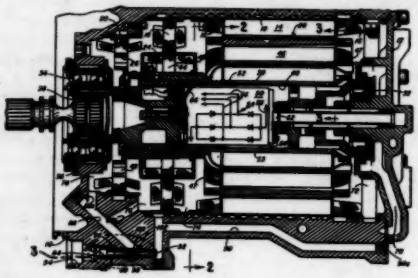
U.S. Cl. 310—62 **16 Claims**

1. In a generator which includes a housing having a plurality of isolated compartments into which oil may leak from the coolant flow passages of the generator, an oil scavenge system comprising:

a plurality of fluid jet pumps mounted internally of the housing integral therewith;

passageway means formed by flow passages in the housing communicating each isolated compartment with one of the fluid jet pumps whereby oil leaking into a compart-

ment can be withdrawn therefrom by the respective fluid jet pump; and



conduit means formed by flow passages in the housing for delivering fluid under pressure to the jet pumps for operating the pumps.

4,683,390

TERMINAL STRUCTURE FOR AN AUTOMOTIVE AC GENERATOR

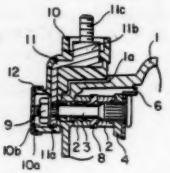
Hideo Imori, and Katsumi Adachi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,872

Claims priority, application Japan, Apr. 10, 1985, 60-54520[U]

Int. Cl.⁴ H01R *3/00*

U.S. Cl. 310—71 **6 Claims**



1. A terminal structure for an automotive AC generator having a housing rotatably supporting a rotary shaft of the generator and a rectifier accomodated in the housing, said terminal structure comprising an output terminal assembly including an axial output terminal member connected to the rectifier and disposed axially within the housing, said axial output terminal member having one end extending through and projecting outwardly from an outer surface of the housing substantially parallel to the axis of the generator shaft, and a radial output terminal member connected with said one end of said axial output terminal member, said radial output terminal member extending radially adjacent the outer surface of the housing and having a terminal end extending substantially perpendicularly to the axis of the generator shaft for connection with an external wiring member, and anti-rotation means cooperating with the generator housing for preventing rotation of said radial output terminal member relative to the housing whereby said radial output terminal member is held substantially perpendicularly to the axis of the generator shaft.

4,683,391

MAGNETICALLY FLOATING ACTUATOR HAVING ANGULAR POSITIONING FUNCTION

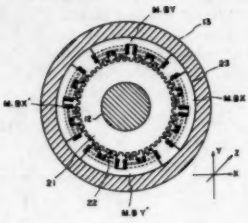
Toshiro Higuchi, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,813

Claims priority, application Japan, Mar. 22, 1985, 60-56024

Int. Cl.⁴ F16C *39/06*

U.S. Cl. 310—90.5 **9 Claims**



1. A magnetically floating actuator having an angular positioning function, comprising:

a rotor having surface teeth spaced circumferentially at a predetermined pitch;

a stator comprising a core member having poles arranged in a plurality of pole groups, said groups being arranged in diametrically opposite pairs of groups and said stator including at least two circumferentially spaced pairs of said pole groups;

each pole group including a plurality of poles formed with spaced teeth juxtaposed to said rotor teeth to form a stepping motor; and

a plurality of winding means on each said pole group, said winding means comprising a first winding means having at least one coil arranged on each pole group so as to control said pole group as a magnetic flotation means for said rotor and a second winding means comprising coils wound on said poles so as to constitute angular position means for said rotor as the rotor of said stepping motor about its axis of rotation.

4,683,392

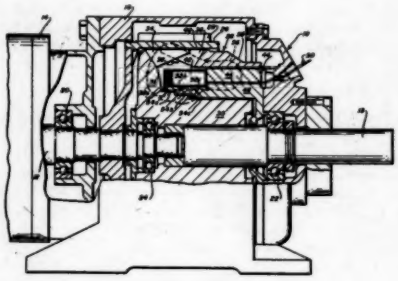
EDDY CURRENT COUPLING HAVING STEPPED ROTOR AND COIL SUPPORT

Daniel J. MacDonald, Brookfield, and Thomas H. Jones, Wauwatosa, both of Wis., assignors to MagneTek, Inc., Encino, Calif.

Filed Apr. 26, 1982, Ser. No. 371,900

Int. Cl.⁴ H02K *49/02*

U.S. Cl. 310—105 **2 Claims**



1. An eddy current coupling comprising:

rotatable input and output shafts;

a generally tubular inductor member mounted on one of said input and output shafts for rotation therewith;

a magnetic rotor member having a collar mounted on the other of said input and output shafts for rotation therewith, said rotor member being located within said inductor member and having a plurality of peripheral, arcuately spaced poles separated from said inductor member by a circumferential air gap;

a field coil generating an encircling magnetic flux causing torque transmission between said inductor and rotor members and said input and output shafts; and

a flux carrying support for said field coil, said support positioning said field coil radially inwardly from said rotor member and between said poles and collar, said support having a first portion for affixing said support in said coupling, said support having a second portion extending along said collar for supporting said coil at the end of said second portion, said collar and second portion having a stepped configuration increasing the thickness of said coil support in a step-wise manner in a direction away from said coil and toward said first portion of said support whereby a plurality of flux carrying air gaps are interposed between said collar and second portion.

4,683,393

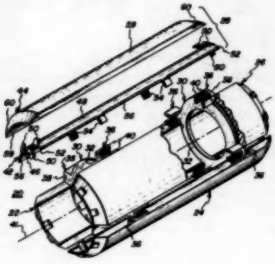
REINFORCED ROTOR ASSEMBLY AND METHOD OF MAKING SAME

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 23, 1986, Ser. No. 866,527

Int. Cl.[4] H02K *15/02, 21/16*

U.S. Cl. 310—156 **11 Claims**



1. A rotor assembly comprising:

at least one stiffening ring including at least two radially outwardly extending tangs;

at least two flux ring segments of magnetic flux conducting material, each of said flux ring segments disposed about the outer circumference of said stiffening ring with at least one tang separating each adjacent pair of said flux ring segments;

a magnetic body mounted on each of said flux ring segments, each of said magnetic bodies including an arcuate outer surface, said magnetic body outer surfaces forming a substantially cylindrical rotor surface generally coaxial with said stiffening ring;

mounting means for providing an axis of rotation for said rotor assembly; and

a matrix disposed between said stiffening ring, said flux ring segments and said mounting means for maintaining the relative positions therebetween.

4,683,394

ACOUSTIC SURFACE WAVE RESONATOR DEVICE

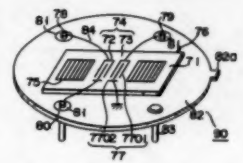
Masayoshi Koshino, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

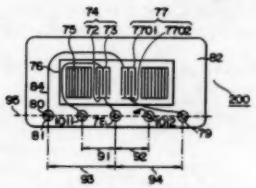
Continuation of Ser. No. 678,756, Dec. 5, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 872,638

Claims priority, application Japan, Dec. 15, 1983, 58-235061; Mar. 6, 1984, 59-41255; Mar. 6, 1984, 59-41256; Aug. 23, 1984, 59-174125

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 R **26 Claims**





1. An assembly for an acoustic surface wave resonator device and a printed circuit board, said assembly comprising:

(a) an acoustic surface wave resonator element having a piezoelectric substrate, first and second interdigital electrodes formed on one major surface of said piezoelectric substrate, said first interdigital electrode including first and second interleaving comb-shaped electrodes separated at a predetermined distance from each other on said major surface of said piezoelectric substrate, said second interdigital electrode including third and fourth interleaving comb-shaped electrodes separated at a predetermined distance from each other on said major surface of said piezoelectric substrate, and a pair of acoustic surface wave reflectors formed on said major surface of said piezoelectric substrate so as to sandwich said first and second interdigital electrodes;

(b) a base for mounting said acoustic surface wave resonator element thereon;

(c) first, second, and third lead terminals arranged on said base at positions substantially corresponding to three adjacent corners of a regular n-sided polygon, said first lead terminal being disposed between said second and third lead terminals;

(d) a first connection member for connecting said first lead terminal to said first interleaving comb-shaped electrode;

(e) a second connection member for connecting said second lead terminal to said third interleaving comb-shaped electrode;

(f) a third connection member for connecting said third lead terminal to said fourth interleaving comb-shaped electrode, and

(g) reference potential applying means coupled to said second interleaving comb-shpaed electrode to apply a reference potential thereto; and

a printed circuit board having first, second, and third openings arranged in correspondence with said first, second, and third lead terminals of said acoustic surface

wave resonator device so as to respectively receive said first, second, and third lead terminals, first and second signal line patterns being respectively provided in said first and second openings, and a grounding line pattern being provided in said third opening;

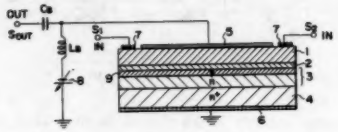
said first, second, and third lead terminals of said acoustic surface wave resonantor device being respectively inserted in said first, second, and third openings of said printed circuit board with a first orientational relationship with respect to said printed circuit board when used in an in-phase oscillator application, said first, second, and third lead terminals being inserted in said openings with a second orientational relationship with respect to said printed circuit board which is different from said first orientational relationship when used in an out-of-phase oscillator application, the difference between the first and second orientational relationshps being provided by rotating said first to third lead terminals by an angle $2\pi/\eta$ of with respect to said printed circuit board.

4,683,395

SURFACE ACOUSTIC WAVE DEVICE

Syuichi Mitsutsuka, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 905,368
Claims priority, application Japan, Sep. 13, 1985, 60-202845
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 R **3 Claims**



1. A surface acoustic wave device comprising:

a low-resistance semiconductive substrate in a first conductivity;

a semiconductive layer in the first conductivity provided on said substrate;

a semiconductive layer in a second conductivity provided on said first conductivity semiconductive substrate;

an insulative layer provided on said second conductivity semiconductive layer;

a piezoelectric layer provided on said insulative layer;

a gate electrode provided on said piezoelectric layer;

two comb-shaped electrodes provided on opposite sides of said gate electrode; and

a bias voltage source connected to said gate electrode, said second conductivity semiconductive layer having an impurity concentration and a thickness which allow a depletion layer to expand throughout it when a bias voltage supplied from said bias voltage source is zero.

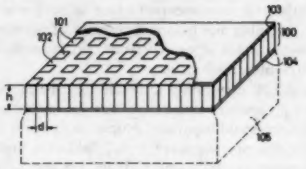
4,683,396

COMPOSITE ULTRASONIC TRANSDUCERS AND METHODS FOR MAKING SAME

Hiroshi Takeuchi, Matsudo; Chitose Nakaya, Nishitama, and Kageyoshi Katakura, Meguro, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,928
Claims priority, application Japan, Oct. 17, 1983, 58-192415; Nov. 2, 1983, 58-204837
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—358 **19 Claims**

1. A composite ultrasonic transducer comprising a plurality of ceramic piezoelectric poles having a height, arranged in a plate-like polymer matrix having opposing surfaces, wherein said piezoelectric poles are arranged such that their height direction is perpendicular to said opposing surfaces, the volume ratio of said piezoelectric poles to that of the entire composite is in the range of 0.15 to 0.75, and the height of each of said piezoelectric poles is larger than a spacing between every adjacent piezoelectric pole.

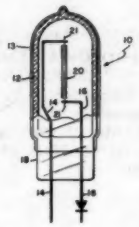


4,683,397

COMPACT INCANDESCENT COILED COIL FILAMENT

Pierce Johnson, Jr., Topsfield, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Apr. 14, 1986, Ser. No. 852,010
Int. Cl.[4] H01J *1/16, 19/10*; H01K *1/14*
U.S. Cl. 313—344 **14 Claims**



1. An incandescent lamp comprising:

a hermtically sealed light transmissive envelope;

means for structurally and electrically mounting a filament within said envelope; and

a refractory metal coiled coil filament electrically coupled to and supported by said means for mounting wherein the primary winding diameter D_1 and the secondary winding diameter D_2 of said filament are:

$$D_1 = d(A+2)$$

and

$$D_2 = D_1(B+2)$$

wherein:

d = the filament wire diameter

$1.40 \leqq A \leqq 4.00$

$B \geqq A$

such that said filament exhibits an increase in compactness and retains or exhibits an increase in structural rigidity.

13. A method of making a coiled coil filament that exhibits an increase in compactness and retains or exhibits an increase in structural rigidity for an incandescent lamp rated at a particular wattage, voltage and efficacy, said method comprising the steps of:

providing a strand of fibrous filament wire having a predetermined length L and diameter d for a desired wattage, voltage and efficacy;

winding said filament wire around a primary mandrel having a diameter M_1 determined by $M_1 = A(d)$, to produce a primary coil, wherein $1.40 \leqq A \leqq 4.00$; and

winding said primary coil around a secondary mandrel having a secondary mandrel diameter M_2 detremined by $M_2=B(M_1+2d)$, to produce a coiled coil configuration, where $B \geqq A$.

4,683,398

PROJECTION TELEVISION DISPLAY TUBE AND DEVICE HAVING INTERFERENCE FILTER

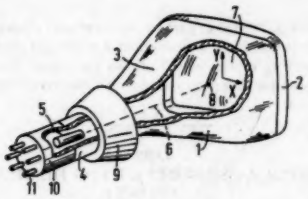
Leendert Vriens, Eindhoven, Netherlands; John A. Clark, Carshalton, United Kingdom, and Johannes H. M. Spruit, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,862

Claims priority, application United Kingdom, May 29, 1985, 8513558

Int. Cl.[4] H01J *29/89*

U.S. Cl. 313—474 **17 Claims**



1. A projection television display tube comprising in an evacuated envelope a display screen on the inside of a display window in the wall of the envelope, said display screen comprising a layer of a luminescent material and a multilayer interference filter between said luminescent material layer and the display window, the filter comprising a number of layers alternately having a high refractive index and a low refractive index, characterized in that the inside of the display window is substantially convex having an angle of curvature ϕ, wherein ϕ is the angle between the axis normal to the center of the display screen and a line normal to the part of the display screen farthest remote from the center, and wherein ϕ is between 5° and 25°, and further characterized in that the filter is composed of at least 6 layers each having an optical thickness nd, wherein n is the refractive index of the material of the layer, and d is the thickness of the layer, said optical thickness being between 0.2 λ_f and 0.3 λ_f, wherein λ_f is equal to p x λ, where λ is the desired central wavelength which is selected from the spectrum transmitted by the luminescent material and p is a number between 1.18 and 1.32.

4,683,399

SILICON VACUUM ELECTRON DEVICES

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 29, 1981, Ser. No. 278,528

Int. Cl.[4] H01L *29/90;* **H01J** *40/16*

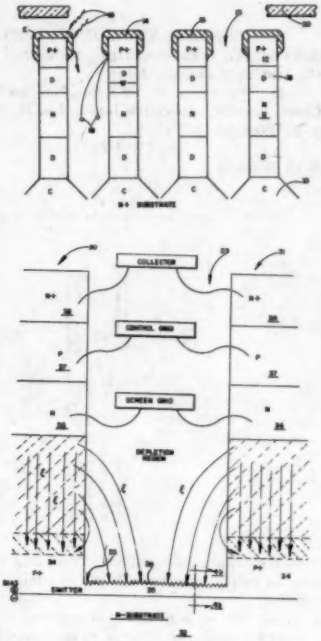
U.S. Cl. 313—537 **102 Claims**

1. A vacuum electron device comprising:

a hermetically sealed container enclosing a vacuum;

a semiconductor device in said container comprising a semiconductor body including an electron emissive source portion for emitting electrons into the vacuum and a collector portion for collecting electrons emitted from said electron emissive source portion and transported through the vacuum;

means for providing a high internal electric field in said semiconductor body such that electrons in said emissive source are excited to energies greater than the electron affinity of said semiconductor body; and



means for establishing a potential between said electron emissive source portion and said collector portion deriving an electrical output from said electron device.

4,683,400

TRAVELLING WAVE TUBE AND HELIX FOR SUCH TRAVELLING WAVE TUBE

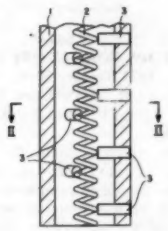
Michael Seal, Amsterdam, Netherlands, assignor to D. Drukker & Zn. N.V., Amsterdam, Netherlands

Filed Oct. 25, 1985, Ser. No. 791,313

Claims priority, application Netherlands, Oct. 31, 1984, 8403311

Int. Cl.[4] H01J *25/34*

U.S. Cl. 315—3.5 **3 Claims**



1. Travelling wave tube comprising a tube, and a helix mounted in said tube, said helix being made of diamond and

being coated at least partially with an electrically conductive material.

4,683,401

MICROWAVE TUBE OUTPUT SECTION

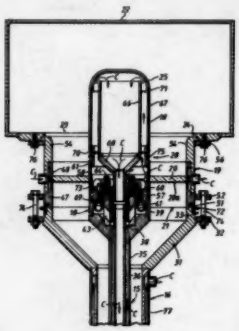
Yukio Okazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1985, Ser. No. 780,308

Claims priority, application Japan, Sep. 28, 1984, 59-203554; Sep. 28, 1984, 59-146776[U]

Int. Cl.⁴ H01J *7/46*

U.S. Cl. 315—39 **9 Claims**



1. A microwave tube output section in a microwave tube having an output cavity which can maintain a vacuum inside, comprising:

a coaxial line section having an internal conductor and an external conductor coupled to said output cavity; and

a dielectric air-tight ring which is attached so as to be vacuum-tight between an outer wall of the internal conductor and an inner wall of the external conductor of the coaxial line section;

wherein the internal conductor is cylindrical, and is divided into two parts at a position on the output cavity side of the dielectric air-tight ring in the coaxial line, each of said two parts including thin weld rings attached to respective inner walls of the two parts of the divided internal conductor, these thin weld rings being welded together so as to be air-tight; and

wherein the external conductor is divided into two parts at a position on the output cavity side of the dielectric ring in the coaxial line, each of said two parts of the external conductor including thin weld rings attached to outer walls of the two parts of the divided external conductor, said thin weld rings of the external conductor parts being welded together so as to be air-tight, and the two parts of the respective conductors each mutually electrically contacting.

4,683,402

ADAPTORS FOR FLUORESCENT LAMPS

Truman Aubrey, 1472 Beaudry Blvd., Glendale, Calif. 91208

Filed Apr. 25, 1985, Ser. No. 727,300

Int. Cl.⁴ H01J *17/34, 7/44*

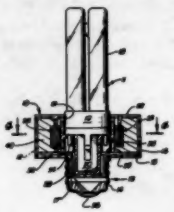
U.S. Cl. 315—56 **9 Claims**

1. An adaptor which facilitates the installation into a light fixture designed for conventional incandescent light bulbs of a fluorescent lamp having an elongated bulb portion, a base and depending from the base a starter portion and a pair of pin electrodes on opposite sides of the starter portion comprising:

a. housing having a centrally disposed passageway which passes through the housing;

b. mounting means depending from the underside of the housing for mounting the adaptor to a light fixture for conventional incandescent light bulbs, said mounting means having a receiving chamber therein which is in alignment with the centrally disposed passageway through the housing;

c. ballast means disposed within the housing having a central passageway therethrough which is coaxial with the centrally disposed passageway through the housing;



d. a socket defined in part by said centrally disposed passageway through the housing and a receiving chamber of the mounting means which allows the starter portion of the fluorescent lamp to extend into the receiving mounting means.

4,683,403

DIMMER PASSING DEVICE FOR HEADLAMP OF VEHICLE

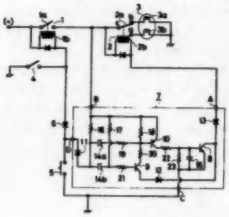
Tadashi Iwamoto; Toshiki Ikeda; Kazuo Yukitomo, all of Hiroshima; Masaichi Hattori, Aichi; Kaneyasu Arakawa, Aichi; Koichi Kihira, Aichi, and Akira Hanaki, Aichi, all of Japan, assignors to Mazda Motor Corporation, Aichi, Japan

Filed Jul. 17, 1986, Ser. No. 886,404

Claims priority, application Japan, Jul. 24, 1985, 60-113500[U]

Int. Cl.⁴ B60Q *1/02*

U.S. Cl. 315—83 **4 Claims**



1. A dimmer passing device for a headlamp of a vehicle comprising:

a light switch operable selectively to an on and off state;

a momentary control switch operable selectively to an on and off state;

a light relay operative when driven for energizing one of a low beam portion and a high beam portion of said headlamp;

first circuit means connecting said light relay to said light switch for activating said light relay in response to the on state of said light switch;

second circuit means connecting said light relay to said momentary control switch for activating said light relay in response to the on state of said momentary control switch;

latch circuit means including an internal switching element operative to alternately turn on and off said internal switching element in response to the on state of said momentary control switch;

a dimmer relay operative to a first position for causing said

light relay to energize said low beam portion and operative to a second position for causing said light relay to energize said high beam portion; and

third circuit means for operating said dimmer relay to said second position at times when said internal switching element is in the on state, and for operating said light relay to energize said low beam portion at times when said dimmer relay is operated to said first position and said internal switching element is in the off state.

4,683,404

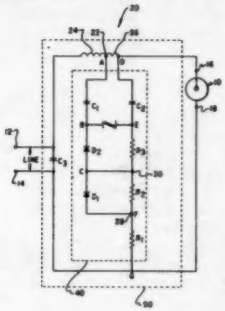
STARTING CIRCUIT AND APPARATUS FOR HIGH PRESSURE SODIUM LAMPS

William H. Hitchcock, Vicksburg, Miss., assignor to Cooper Industries, Houston, Tex.

Filed Sep. 29, 1986, Ser. No. 912,037

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—289 **4 Claims**



1. A circuit for incorporation into a starting apparatus for a high pressure sodium discharge lamp, said circuit comprising a six-node (A, B, C, D, E, F, G) electrical network including a first capacitor having a known capacitance C1 connected between network nodes (A) and (B); a second capacitor having a known capacitance C2 connected between network nodes (D) and (E); a first, second, and third resistors having known resistances R1, R2, R3 connected between network nodes (E) and (C), (C) and (F), and (F) and (G), respectively; first and second diodes D1, D2 connected between network nodes (B) and (C), and (C) and (F), respectively; and a bilateral symmetrical voltage sensitive switch connected between network nodes (B) and (E).

4,683,405

PARABOLIC VOLTAGE GENERATING APPARATUS FOR TELEVISION

Walter Truskalo, Titusville, and Thomas F. Nolan, Wrightstown, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 27, 1986, Ser. No. 879,304

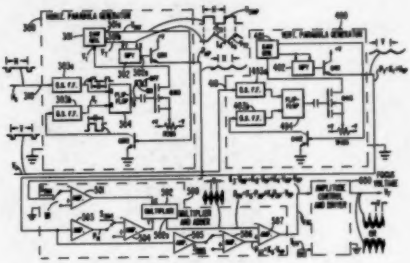
Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **11 Claims**

1. A video apparatus responsive to a periodic synchronizing signal at a frequency that is related to a deflection frequency for generating a parabolic first signal synchronized to said synchronizing signal, comprising:

means responsive to said synchronizing signal for generating a sawtooth waveform having, during a given period of said sawtooth waveform, an upramping portion, a downramping portion and a substantially flat portion;

means responsive to said synchronizing signal and coupled to said sawtooth waveform generating means for varying the length of said flat portion when a change occurs in the length of the period of said synchronizing signal without affecting the length of each of said downramping and upramping portions such that the length of said given period of said sawtooth waveform is determined in accordance with the length of the period of said synchronizing signal and such that said sawtooth waveform becomes synchronized to said synchronizing signal; and



means responsive to said sawtooth waveform for generating from said upramping and downramping portions corresponding portions of said parabolic first signal.

4,683,406

JOINT ASSEMBLY MOVABLE LIKE A HUMAN ARM

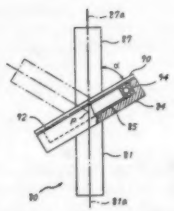
Hiroki Ikeda, and Nobuaki Takanashi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 7, 1985, Ser. No. 742,711

Claims priority, application Japan, Jun. 8, 1984, 59-117747; Oct. 5, 1984, 59-151070[U]; Oct. 11, 1984, 59-212878; Oct. 11, 1984, 59-212879; Oct. 11, 1984, 59-212880; Oct. 12, 1984, 59-213874

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568 **11 Claims**



1. A joint assembly for joining a reference end to a free end to move said free end relative to said reference end, said joint assembly comprising:

a first axle member having a first axis, a first axis end rotatably supported on said reference end, and a second axis end, defining an axis end plane oblique to said first axis at a predetermined angle;

a second axle member having a second axis concurrent with said first axis, a third axis end rotatably guided along said axis end plane, and a fourth axis end adjacent to said free end; and

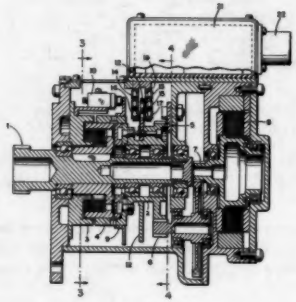
coupling means for coupling said fourth axis end to said reference end and said free end to move said free end in cooperation with said first and said second axle members.

4,683,407

AUTHORITY LIMITER

Valentin G. Barba, Princeton Junction, N.J., and Eugene E. Shube, Elmont, N.Y., assignors to Plessey Incorporated, New York, N.Y.

Filed Apr. 2, 1985, Ser. No. 719,150
Int. Cl.[4] G05B *17/00*; B64C *3/18*
U.S. Cl. 318—689 **6 Claims**



1. In combination with an autopilot transfer device, an authority limiter comprising:

a. an input shaft which is normally free to rotate in either direction;

b. a motor gear output shaft;

c. an electromagnetic clutch used to couple the input shaft to the motor gear output shaft;

d. a torque motor geared to said output shaft;

e. An obtruding disc attached to the motor gear output shaft, said obtruding disc having at least three arcuate cut-out portions therethrough respectively indicative of a null agular position of said output shaft and at least two predetermined degrees of permissible angular deviation in either direction from said null position by said output shaft;

f. at least three stationary opto sensors activated by the presence or absence of said cut-out portions of said obtruding disc and producing outputs respectively representative of the direction of angular deviation by said output shaft from said null position and of any angular deviation exceeding either of said two predetermined degrees of angular deviation; and

g. an electronic circuit means for controllably applying at least two scheduled currents, dependent upon the outputs of said opto sensors, to said torque motor to generate two corresponding scheduled opposing torques in either opposing direction on said output shaft when the angular deviation thereof exceeds a corresponding predetermined degree of angular deviation.

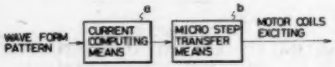
4,683,408

STEPPING MOTOR CONTROL APPARATUS

Akira Inoue; Shinichi Nomura, and Osamu Hanami, all of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Oct. 4, 1985, Ser. No. 784,179
Claims priority, application Japan, Dec. 25, 1984, 59-279313
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **14 Claims**

1. A stepping motor control apparatus for controlling the stepwise rotation of a rotor of a stepping motor, comprising: driving means for applying different drive currents to a stepping motor to selectively effect regular step rotation of the stepping motor rotor at a fixed angular interval and a variable step rotation of the rotor from a temporary hold position to a desired final hold position through a variable angular transfer distance which is shorter than the fixed angular interval; means for providing transfer data of the variable step rotation including data representative of the temporary hold position, and data defining the angular transfer distance and the final hold position; and control means responsive to the transfer data for producing an accelerating drive current effective to accelerate the movement of the rotor from the temporary hold position through a part of the angular transfer distance, a decelerating



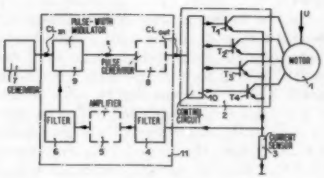
drive current effective to decelerate the movement of the rotor to the final hold position through another part of the angular transfer distance, and a holding drive current effective to hold the rotor at the final hold position so as to enable the driving means to sequentially apply the accelerating, decelerating and holding drive currents to the rotor.

4,683,409

STABILIZING ARRANGEMENT FOR A STEPPING MOTOR

Pierre Boillat, Meyriez, Switzerland, assignor to Sodeco-Saida AG, Murten, Switzerland

Continuation-in-part of Ser. No. 706,501, Feb. 28, 1985. This application Apr. 21, 1986, Ser. No. 854,337
Claims priority, application Switzerland, Feb. 24, 1986, 00727/86
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **11 Claims**



1. A stabilizing arrangement for a stepping motor comprising:

a pulse-width modulator for modulating control pulses of said stepping motor, said pulse-width modulator receiving an error correction signal as one input and the output of a cycle generator as the other input, said error correction signal being generated by a current sensor by way of a low pass filter and a high pass filter,

said pulse-width modulator comprising a controllable saw-tooth generator and a comparator connected to the output of the saw-tooth generator for comparing the saw-tooth signal produced by the saw-tooth generator with the error-correction signal,

said saw-tooth generator comprising a capacitor, a controllable switch, connected in parallel to said capacitor, a controllable current source connected in series to said capacitor, and a control device, the input of the control device being connected to said capacitor and the output of said control device being connected to a control input of the controllable current source by way of a diode, a control input of said controllable switch being connected to an input of the controllable saw-tooth generator.

4,683,410

METHOD FOR DETECTING STEP LOSSES IN STEPPING-MOTOR-DRIVEN ADJUSTING DEVICES

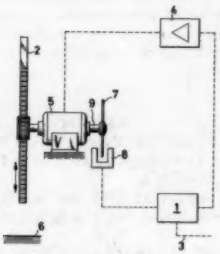
Rudolf Kressirer, Frankfurt am Main, and Siegfried Oehler, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 24, 1985, Ser. No. 748,315

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423420

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **2 Claims**



1. A method of detecting step losses caused by ineffective driving pulse commands in a stepping motor driven actuating device movable through incremental steps, said motor having a shaft and a rotor rigidly attached to said shaft said rotor having a plurality of segments providing alternate light and dark fields, said method comprising:

determining a desired position of the actuating device;

generating a plurality of drive pulse sequences, each said sequence of drive pulses operative to move said actuating device a single step;

sensing said alternate light and dark fields at a single position adjacent said rotor in response to operation of the stepping motor;

generating a light pulse sequence of binary bits in response to sensing of the light and dark fields during rotation of said rotor, each light pulse of said light pulse sequence having a duration corresponding to each said drive pulse sequence;

comparing each bit of said light pulse sequence of binary bits to said plurality of driving pulse sequences during the stepping of the motor to detect said step losses of the actuating device from said desired position.

4,683,411

SYNCHRONOUS MOTOR PROTECTION

James W. Hamilton, Jr., Mebane, and Edward A. Long, Chapel Hill, both of N.C., assignors to General Electric Company, Charlottesville, Va.

Continuation of Ser. No. 652,983, Sep. 21, 1984, Pat. No. 4,641,074. This application Sep. 2, 1986, Ser. No. 902,940

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—706 **33 Claims**

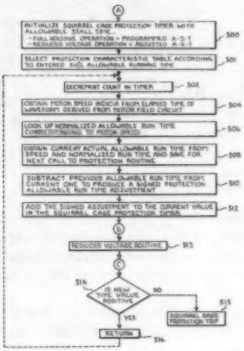
1. In a digital control system for protecting a plurality of synchronous motors having squirrel cage windings, during full or reduced voltage start-up, the combination comprising:

(a) means for storing digital data representative of a plurality of thermal limit characteristic curves corresponding to a plurality of synchronous motors each having a different starting torque, said curves having an independent function representative of instantaneous motor speed and a dependent function representative of maximum allowable motor excitation time, the thermal limit characteristic curves each covering a speed range of from substantially zero speed to substantially synchronous speed;

(b) programmable means for manual entry of data representative of at least two set points for any motor being controlled by the digital control system, each set point having a value representative of the maximum allowable motor excitation time of said controlled motor at a predetermined motor speed;

(c) motor speed signal means for deriving a motor speed signal indicative of actual motor speed from AC energization applied to any motor being controlled by the control system;

(d) digital processing means responsive to the digital data, the set points and the motor speed signal for sequentially deriving the maximum allowable excitation time for any controlled motor to attain any instantaneous motor speed during acceleration and for providing an output signal indicative of the actual accrued excitation time exceeding the maximum allowable excitation time said motor being


A
INITIALIZE SQUIRREL CAGE PROTECTION TIMER with
ALLOWABLE STALL TIME
- FULL VOLTAGE OPERATION = PROGRAMMED A-S-T
- REDUCED VOLTAGE OPERATION = ADJUSTED A-S-T
S00
SELECT PROTECTION CHARACTERISTIC TABLE ACCORDING TO ENTERED FULL ALLOWABLE RUNNING TIME
S01
DECREMENT COUNT in TIMER
S02
OBTAIN MOTOR SPEED INDICIA FROM CLASSIC TYPE OF WAVEFORM DERIVED FROM MOTOR FIELD CIRCUIT
S04
LOOK UP NORMALIZED ALLOWABLE RUN TIME
S05
OBTAIN CURRENT ACTUAL ALLOWABLE RUN TIME FROM SPEED AND NORMALIZED RUN TIME AND SAVE FOR NEXT CALL TO PROTECTION ROUTINE
S08
SUBTRACT PREVIOUS ALLOWABLE RUN TIME FROM CURRENT ONE TO PROVIDE A SIGNED PROTECTION ALLOWABLE RUN TIME ADJUSTMENT
S10
ADD THE SIGNED ADJUSTMENT TO THE CURRENT VALUE IN THE SQUIRREL CAGE PROTECTION TIMER
S12
B
REDUCED VOLTAGE ROUTINE
S13
C
S14
IS ADJ. TIME VALUE NEGATIVE
NO
S15
SQUIRREL CAGE PROTECTION TRIP
YES
RETURN
S16

controlled by the control system, said digital processing means comprising:

selection means responsive to at least one of the set points for selecting the tabular representation of one of the plurality of thermal characteristic curves having the closest fit to the value of the at least one of the set points; and

indexing means responsive to the value of the motor speed signal to derive a representation of the maximum allowable motor excitation time applicable to the actual motor speed from the selected one of the tabular representations of said curves; and

(e) output means for reducing motor excitation responsive to the output signal so as to prevent thermal damage to the squirrel cage windings in a motor being controlled by the control system.

4,683,412

CURRENT SOURCE INVERTER MOTOR DRIVE ADAPTED FOR FULL CURRENT REGENERATIVE MODE OPERATION

Edward J. Bialek, Buffalo, N.Y., and Leslie B. Anticich, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1985, Ser. No. 800,253

Int. Cl.[4] H02P *3/18*

U.S. Cl. 318—798 **4 Claims**

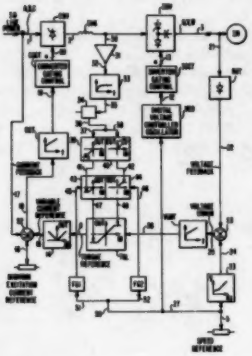
1. In a current source inverter (CSI) motor drive control system including: an AC/DC converter and an inverter coupled thereto through a DC link for supplying excitation to an induction motor; means operative at constant volts-per-hertz for deriving a voltage error in relation to the motor voltage and a speed reference signal; and a PI controller means responsive to said voltage error for generating a torque representative signal;

said inverter being controlled in relation to said speed refer-

ence signal; and said converter being controlled in relation to a current reference signal to vary the DC link current in accordance with said current reference signal;

the combination of:

means for deriving a signal representative of the DC voltage of said DC link in sign and magnitude;



means responsive to the magnitude of said DC voltage representative signal for generating in response to said torque representative signal a torque reference signal in accordance with the sign of said DC voltage representative signal; and

absolute value function generator means responsive to said torque reference signal for generating said current reference signal.

4,683,413

REDUCING POWER CONSUMPTION AND MONITORING SYNCHRONOUS RUNNING OF THREE-PHASE ELECTRIC MOTORS

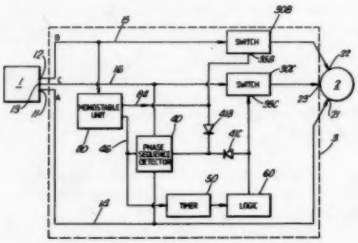
Anton M. Bax, Forthampton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Oct. 3, 1985, Ser. No. 783,400

Claims priority, application United Kingdom, Oct. 3, 1984, 8424989

Int. Cl.[4] H02P *5/28*

U.S. Cl. 318—779 **10 Claims**



5. A motor control system comprising: three phase supply lines; first and second switching means; means connecting said first and second switching means respectively in a first and second of the supply lines; control means; means connecting said control means to said first and second switching means, said control means causing both said switching means to be initially closed such that power is supplied to said motor on all said lines, said control means causing said first switching means to be opened when said motor has reached a predetermined speed so that power supply to said motor on said first line is thereby interrupted, said control means subsequently periodically closing said first switching means to enable power supply to the motor on the first line for short intervals, and periodically opening said second switching means to prevent power supply to the motor on the second line for short intervals thereby to cause hunting of the motor only when the motor is running in synchronism with the supply; means for detecting hunting of the motor; means for indicating synchronous running of the motor in response to detected hunting of the motor; phase detector means; means connecting said phase detector means to receive signals from the first and second lines; said phase detector means being responsive to the phase relationship between signals on the first and second supply lines, said phase detector means being operable to open both the first and second switching means thereby to prevent supply of power to said motor when an undesired phase relationship occurs between said signals.

4,683,414

BATTERY ECONOMISING CIRCUIT

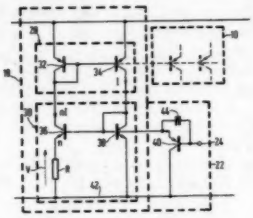
Paul A. Moore, Hove, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1985, Ser. No. 757,234

Claims priority, application United Kingdom, Aug. 22, 1984, 8421315

Int. Cl.[4] H01M *10/44;* **G05F** *3/26*

U.S. Cl. 320—13 **8 Claims**



1. A current reference circuit for switching a current of an operating circuit comprising:

first and second opposing current mirror circuits, connected together and between first and second power supply terminals, said first and second mirror circuits having a total loop gain of substantially unity, said connected current mirrors having first and second stable current states; said first state corresponding to substantially zero current level passing between said first and said second mirror circuits; and

a control circuit connected to switch said current mirrors between said first and second stable states comprising means for momentarily diverting current around one of said mirror circuits whereby said first state is assumed, and for injecting current into an input of said one mirror circuit whereby said second non-zero current state is assumed.

4,683,415

LINE FREQUENCY SWITCHING POWER SUPPLY

Matt J. Zimmerman, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 15, 1986, Ser. No. 906,872

Int. Cl.[4] G05F *1/46*

U.S. Cl. 323—282 **2 Claims**

1. A power supply, comprising:

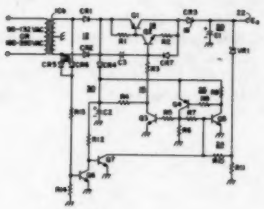
a rectifier circuit coupled to a secondary winding of a transformer adapted to receive a cyclic line voltage, said rectifier circuit producing a pulsating D.C. voltage;

a pass element coupled to said rectifier circuit;

a filter coupled to said pass element to provide a filtered

D.C. output voltage in response to the output of said pass element;

means for sensing when said output voltage reaches a predetermined value;



latch means coupled to said sensing means and responsive thereto to switch said pass element off; and

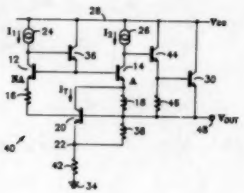
means for detecting when said line voltage crosses a zero point in its cycle and resetting said latch means and enabling said pass element.

4,683,416

VOLTAGE REGULATOR

Byron G. Bynum, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 6, 1986, Ser. No. 915,483
Int. Cl.[4] G05F *3/16*
U.S. Cl. 323—314 **17 Claims**



1. A regulated voltage supply, comprising:

first and second transistors arranged with the bases thereof coupled together to conduct respective currents therethrough;

first and second resistors coupled to said first and second transistors respectively with the current flowing through said first transistor also flowing through said first resistor and a portion of the current flowing through said second transistor also flowing through said second resistor;

a third transistor having its collector-emitter conduction path coupled between the emitter of said second transistor and a circuit node;

feedback circuit means coupled between the collector of said second transistor and the base of said third transistor which is responsive to the voltage level at the collector of said second transistor for providing feedback to said third transistor to set the collector current therethrough wherein said first and second transistors are operated at different current densities thereby producing a difference voltage therebetween having a predetermined temperature coefficient (TC) and magnitude, said third transistor conducting the remainder portion of the current from said second transistor and said current flowing through said third transistor having a predetermined magnitude and said temperature coefficient; and

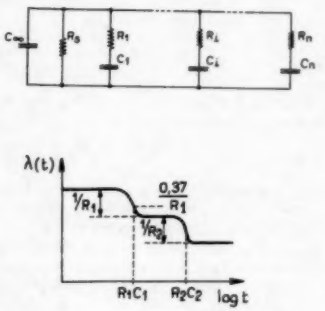
means for developing a voltage at said circuit node that is a function of the current sourced to said circuit node, said voltage having a controlled magnitude and TC which is proportional to absolute temperature.

4,683,417

METHOD AND APPARATUS FOR RAPIDLY TESTING CAPACITORS AND DIELECTRIC MATERIALS

Michel De Burgat, Rennes; André Le Traon, Cesson Sevigne; Jean-Claude Pilet, and Ammar Sharaiha, both of Rennes, all of France, assignors to Universite de Rennes I, Rennes, France

Filed May 10, 1985, Ser. No. 733,149
Claims priority, application France, May 10, 1984, 84 07196
Int. Cl.[4] G01R *27/26, 11/52*
U.S. Cl. 324—60 C **37 Claims**



1. A method of testing capacitors and dielectric materials, wherein the method comprises the following steps:

(i) inserting the item to be tested in series with a reference impedance in a measuring chain;

(ii) applying repetitive stimulating voltage pulses to the measuring chain;

(iii) zeroing the voltage at the terminals of the reference impedance during each inactive half-cycle of the stimulating pulses;

(iv) sampling the response obtained at the terminals of the reference impedance for each stimulating pulse at time instants which are progressively shifted relative to the beginning of the stimulating pulses; and

(v) analyzing the samples to deduce parameters of the element under test in accordance with a Foster model comprising a plurality of main parallel connected branches, each of which is constituted by a resistance and a capacitance connected in series, together with two auxiliary branches which are likewise connected in parallel and are respectively constituted by a pure capacitance and by a pure resistance wherein the value of said resistances and capacitances of the Foster model represent said parameters.

4,683,418

MOISTURE MEASURING METHOD AND APPARATUS

Edward D. Wagner, and Richard R. Trautwein, both of Rogue River, Oreg., assignors to Wagner Electronic Products, Inc., Rogue River, Oreg.

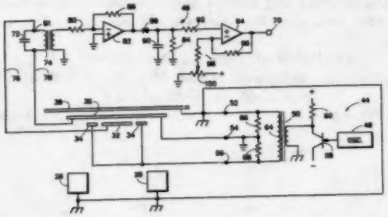
Filed Aug. 6, 1984, Ser. No. 638,020
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 P **11 Claims**

2. The method of measuring the moisture content of material comprising:

passing a first radio frequency signal through said material for reception by a receiving plate;

transmitting a second radio frequency signal in out-of-phase relation to said first radio frequency signal with respect to a common reference, said second signal being transmitted from a source adjacent said receiving plate without passing through said material, said first and second radio frequency signals inducing a potential in said receiving plate, the induction of said first radio frequency signal

varying in accordance with the moisture contained in said material; and



measuring the potential of said receiving plate to determine the extent of said moisture.

4,683,419

METHOD AND APPARATUS FOR DETECTING FAULTS IN A STRUCTURE BY MEASURING VOLTAGE DROP BETWEEN SURFACE POINTS THEREOF

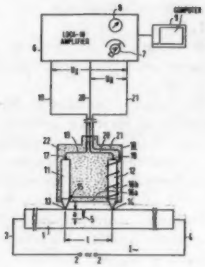
Rolf Neuelmann, Bergisch-Gladbach, and Manfred Fortmann, Overath, both of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,548

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434801; Jan. 18, 1985, 3501614

Int. Cl.[4] **G01R** *27/14, 27/26;* **G01N** *27/82*

U.S. Cl. 324—64 **24 Claims**



1. Method for monitoring structures by measuring electrical quantities, which comprises subjecting an electrically conducting component to an ac current with a predetermined frequency in a given direction generating a magnetic flux in a given direction, measuring a voltage drop across two measurement points mutually spaced apart by a given distance at individual partial regions of the component by means of two measuring lines contacting the component, a segment of one of said measuring lines extending parallel to said component, in closely spaced relation thereto, from the region of one of said measurement points to the region of the other one of said measurement points, wherein said two measuring lines, including said segment of said one of said measuring lines extending between said two measurement points, and the component disposed between said two measurement points form a first conductor loop with an inductively effective area between said segment and said component being as small as possible mesuring an induction voltage from the change of the magnetic flux as close as possible to said two measuring points by means of a second conductor loop being substantially parallel to the given direction of the current and perpendicular to the given direction of the magnetic flux; feeding the voltage drop and the induction voltage to an electronic evaluation circuit, and deriving the local resistance of the component at the measurement points from the voltage drop and the induction voltage with the evaluation circuit.

4,683,420

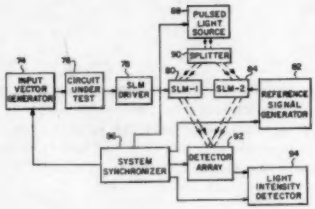
ACOUSTO-OPTIC SYSTEM FOR TESTING HIGH SPEED CIRCUITS

Anastasios P. Goutzoulis, Forest Hills Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1985, Ser. No. 753,506

Int. Cl.[4] **G01R** *31/26, 17/02, 19/10*

U.S. Cl. 324—73 R **20 Claims**



1. An optical system for testing high speed logic devices, said system comprising:

means for driving the device under test with a set of input vectors;

first means for producing a pulsed light signal;

a first spatial light modulator;

first means for loading a predetermined number of time sequenced binary values of an output signal from the device under test into said spatial light modulator;

means for detecting the spatial light intensity of a modulated light signal produced when said pulsed light signal passes through said spatial light modulator;

means for analyzing the detected light signal intensities; and

means for synchronizing the operation of said driving, producing, detecting, and analyzing means, said synchronizing causing the light signal to be pulsed on after said predetermined number of binary values of the input vector driven output signals have been loaded into the spatial light modulator.

4,683,421

DRIFT COMPENSATION TECHNIQUE FOR A MAGNETO-OPTIC CURRENT SENSOR

Robert C. Miller, Penn Hills Township, Allegheny County, and Juris A. Asars, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,989

Int. Cl.[4] **G01R** *31/00, 33/00;* **G01J** *1/32;* **G02F** *1/31*

U.S. Cl. 324—96 **4 Claims**

4. In a magneto-optic current measuring system including a magneto-optic current sensor of a material composition exhibiting different Verdet Constants (V) at different wavelengths, and functioning as a Faraday rotator by receiving a polarized light input and generating a light output, the rotation of which is indicative of the current flow in an adjacent electrical conductor, and converter means for converting said light output to electrical signals:

the improvement for providing drift compensation for said system, said improvement comprising:

an input circuit means including:

(a) a first light source for emitting light at a first wavelength and a second light source for emitting light at a second wavelength;

(b) a light activating control means for alternately activating said first and second light sources; and

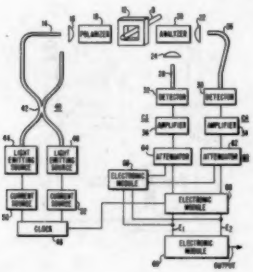
(c) an optical coupler means for introducing the light output

from said alternately activated first and second light sources to said magneto-optic current sensor;

an output circuit means including:

(a) means responsive to electrical signals representing the light output of said first and second light sources transmitted through said magneto-optic current sensor for generating first and second output signals indicative of the intensity of the light output at said first and second wavelengths, respectively; and

(b) means for responding to the first and second output



signals by computing the magnitude of the first output signal multiplied by V_2 minus the second output signal multiplied by V_1, where V_1 and V_2 are the Verdet constants of the material composition of the magneto-optic current sensor at said first and second wavelengths respectively; and

means for adjusting the gain of at least one of said input circuit means and output circuit means to maintain the magnitude of the first output signal multiplied by V_2 minus the second output signal multiplied by V_1 essentially constant.

4,683,422

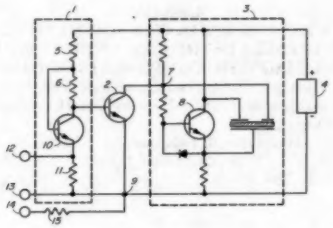
LOW VOLTAGE CONTINUITY TESTER

David R. Goodson, 28267 Tahoe Ct., Hayward, Calif. 94545

Filed Sep. 20, 1985, Ser. No. 778,145

Int. Cl.[4] G01R *31/08*

U.S. Cl. 324—133 **9 Claims**



1. A continuity tester for tracing circuit paths by applying test voltages below any conduction threshold of the circuits under test and by sensing a continuity induced current, comprising:

(A) indicator means (**3**) actuated in response to the presence of continuity;

(B) switching means (**2**), controlling said indicator means, having a threshold with temperature dependency for defining continuity presence;

(C) voltage divider means (**1**), defining said test voltages below any conduction threshold and providing temperature compensation for said switching means, said voltage divider means comprising:

(AA) third resistor, in parallel with a pair of probing terminals being applied to the circuit paths being traced, receiving a biasing current;

(BB) active buffer means (**10**), controlling the switching means and supplying said biasing current to said third resistor and said pair of probing terminals, said active buffer including a junction with temperature sensitivity capable of supplying temperature compensation for said switching means;

(CC) first and second resistor means (**5** and **6**), supplying biasing currents to both the active buffer means and the switching means;

wherein continuity is sensed by a change in the current of the buffer means to an extent sufficient to cross the threshold of the switching means and trigger the indicator means.

4,683,423

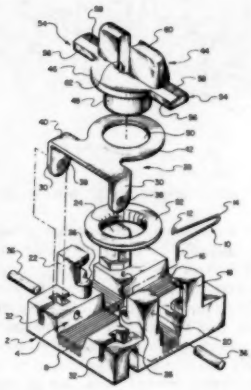
LEADLESS CHIP TEST SOCKET

William D. Morton, Santa Clara, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Oct. 30, 1985, Ser. No. 792,805

Int. Cl.[4] G01R *31/26;* **H01R** *9/09*

U.S. Cl. 324—158 F **22 Claims**



1. A test socket for a leadless chip carrier assembly, the assembly including a leadless chip and a carrier housing the chip, the carrier being adapted to hold a leadless chip in a cavity with the chip's contact pads exposed for probing, comprising (for a reference orientation with the chip contact pads facing downward):

a base member adapted to receive a chip carrier assembly with the exposed chip contact pads facing downward towards the base,

a plurality of spring biased contact members extending upward from within the base member to establish electrical contact with respective contact pads of a chip in the carrier,

a plurality of spaced projecting members extending upward from the base member to a level above the chip carrier assembly, each projecting member including a generally downward facing bearing surface,

a pivot member pivotally retained on the base member for pivoting between an open position permitting the loading of a chip carrier assembly into the base member, and a closed position over the chip carrier assembly, and

a rotatable clamp carried by and rotatable with respect to the pivot member, the clamp having an upper bearing member which fits between the projecting member bear-

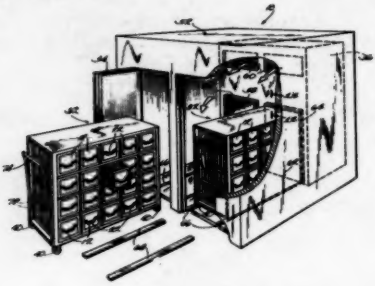
ing surfaces and the pivot member, the bearing member engaging the bearing surfaces of the projecting members and progressively forcing the pivot member more fully closed when the pivot member is at an initially closed position and the clamp is rotated, and the clamp further having a lower clamping member bearing against the chip carrier assembly and progressively urging it down to a positive engagement between the chip contact pads and the spring biased contact members when the clamp is rotated.

4,683,424

APPARATUS FOR USE IN TESTING CIRCUIT BOARDS

Robert A. Cutright; Mark W. Briggs, both of Holland, and George J. Bouwman, Hamilton, all of Mich., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Nov. 7, 1984, Ser. No. 669,117
Int. Cl.[4] G01R *31/28;* H05K *7/14*
U.S. Cl. 324—158 F **40 Claims**



1. An apparatus for testing circuit boards, said apparatus comprising

a plurality of hand manipulable circuit board baskets adapted to contain a plurality of generally planar circuit boards, each of said baskets including

frame means defining a structure of generally open construction, said frame means including a box-like structure having opposite first and second sides, opposite third and fourth sides, and opposite first and second ends, said opposite ends and said first side being closed by walls to prevent air flow therethrough, and said second, third and fourth sides being open to permit air flow therethrough, the circuit boards being suported in perpendicular relation to said third and fourth sides,

a plurality of first electrical connectors supported by said frame means and being adapted to engage electrical connectors on the circuit boards,

a second electrical connector supported by said frame means and being electrically connected with each of said first electrical connectors, and

means for supporting the circuit boards in parallel spaced relationship within said frame means with the electrical connectors on the circuit boards being plugged into said first electrical connectors, whereby in conjunction with said open construction of said frame means air can flow freely through said baskets and over the circuit boards supported therein,

a test chamber for enclosing said baskets and including electrical connector means electrically connected with said second electrical connectors on said baskets, and

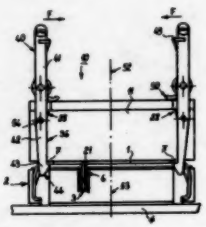
wall means within said test chamber, said baskets being supported within said test chamber with said second side of one of said baskets being closed by said wall means and with said second side of each of the other baskets being closed by said first side of an adjacent basket, whereby said baskets and said wall means define a plurality of air plenums directing air flow through said baskets and over the circuit boards supported therein.

4,683,425

INTEGRATED CIRCUIT TEST CLIP

Jean F. Tossutto, Velizy, and Hervé Bricaud, Plaisir, both of France, assignors to Socapex, Suresnes, France

Filed Oct. 28, 1985, Ser. No. 792,199
Claims priority, application France, Oct. 30, 1984, 84 16596
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 F **25 Claims**



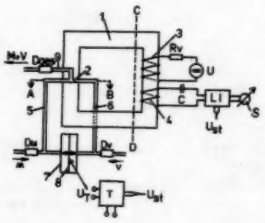
1. An integrated circuit-testing combination of a printed circuit and a test clip, comprising an insulating body having a predetermined number of test clip contacts constructed for establishing electrical connection with inputs-outputs of integrated circuits in a vertical direction, at least two levers oppositely disposed with respect to said insulating body and connected together by at least one cross-piece, each lever having a lower part which ends in at least one hook for hooking onto means for carrying at least one of said integrated circuits, each lever comprising an articulation for permitting rotation with respect to an axis parallel to said cross-pieces and mounted in a manner for pivoting on said body whereby each of said at least one hook can be moved for hooking onto said means for carrying at least one of said integrated circuit, a printed circuit fixed onto said insulating body and having plural conductive circuit paths, each one in electrical contact with a respective one of said predetermined number of test clip contacts, and a connecting cable having plural conductors, each for establishing electrical contact into a respective one of said predetermined number of contacts.

4,683,426

PROCESS AND APPARATUS FOR MEASURING DIFFERENCES IN THE CONCENTRATIONS OF PARAMAGNETIC COMPONENTS OF GASES

Heinz P. Hummel, Königstein-Johanniswald, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 10, 1984, Ser. No. 659,269
Int. Cl.[4] G01R *33/12*
U.S. Cl. 324—204 **6 Claims**



1. A method of measuring a difference in concentration of

paramagnetic components between an unknown gas and a standard gas comprising:

periodically alternating entry of two gases into an air gap of a magnetic circuit by delivering the two gases into the air gap alternately from opposite directions;

moving a boundary zone between the two gases back and forth periodically in the air gap perpendicularly to the lines of force;

alternatingly causing part of the two gases to escape from the air gap region by letting the respective one or other of the two gases flow in behind the respective escaping gas; and

detecting periodic changes, caused by the gases, in magnetic flux in the magnetic circuit.

4,683,427

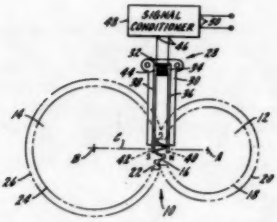
MAGNETIC GEAR TOOTH SEPARATION DETECTOR

Metin M. Durum, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 11, 1985, Ser. No. 786,889

Int. Cl.[4] G01B *7/14;* **G01N** *27/72;* **G01R** *33/00*

U.S. Cl. 324—207 **6 Claims**



1. Gear transmission apparatus comprising a drive gear defining drive gear teeth extending from a root circle thereof, a driven gear defining driven gear teeth extending from a root circle thereof, said drive and driven gear teeth moving into meshing contact at an initial contact point and out of meshing contact at a final contact point as said gears rotate, and means sensing a change in magnetic flux density across said teeth for detecting a break in said meshing contact between said initial and final contact points.

4,683,428

METHOD OF AND A DEVICE FOR IDENTIFYING THE POSITION OF THE ROTOR OF A STEPPING MOTOR

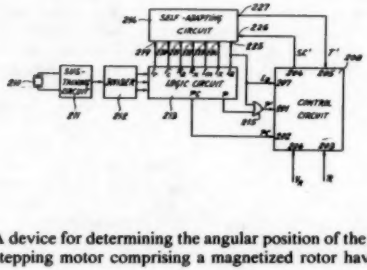
Henri Gête, Les Hauts-Geneveys, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Jul. 17, 1985, Ser. No. 755,753

Claims priority, application Switzerland, Jul. 27, 1984, 03648/84

Int. Cl.[4] G01B *7/14;* **H02P** *8/00;* **G04F** *5/00;* **G06F** *1/04*

U.S. Cl. 324—208 **4 Claims**



4. A device for determining the angular position of the rotor of a stepping motor comprising a magnetized rotor having a pair of diametrically opposite poles liable to lie in two rest positions, a stator forming a magnetic circuit having saturable narrow portions and a coil coupled magnetically to the stator for setting up therein a magnetic field, said device comprising:

means for generating an electric control pulse;

means for applying said pulse to the coil of the motor;

means for measuring a control current, generated in the coil by said pulse, at the end of a control time interval counted from the beginning of said pulse;

memory means for storing said control time interval;

means for comparing the control current with a first reference current and for generating a signal representative of the sign of the comparison, said sign indicating the angular position of the rotor, characterized in that it further comprises:

means for generating a first electric pulse;

means for applying said first pulse to the coil of the motor;

means for measuring a first current in the coil, generated by said first pulse;

means for determining a first time interval corresponding to the time needed by the first current to reach a second reference current;

means for generating a second electric pulse having the same amplitude as the first but of opposite polarity;

means for measuring a second current in the coil, generated by said second pulse;

means for determining a second time interval corresponding to the time needed by the second current to reach the second reference current;

means for adding the second time interval to the first; and

means for calculating the mean value of said two time intervals and for transferring said mean value into said memory means, said value being the control time interval.

4,683,429

ELECTRICAL CIRCUIT WHICH IS LINEARLY RESPONSIVE TO CHANGES IN MAGNETIC FIELD INTENSITY

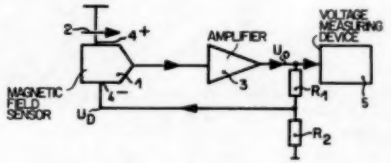
Radivoje Popovic, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Aug. 20, 1984, Ser. No. 642,407

Claims priority, application Switzerland, Aug. 26, 1983, 4664/83

Int. Cl.[4] G01N *27/72;* **G01R** *33/02;* **H03K** *17/90, 19/18*

U.S. Cl. 324—225 **8 Claims**



1. A circuit for measuring the intensity of a magnetic field, said circuit comprising:

(a) a magnetic field sensing device for sensing said magnetic field intensity, said magnetic field sensing device being adapted to produce an electrical output signal (U_{in}), said electrical output signal (U_{in}) being dependent on an electrical input signal (U_D) received at an electrical control input and said magnetic field intensity, the electrical output signal (U_{in}) of said magnetic field sensing device having a sensitivity (K_H) to said magnetic field intensity and a sensitivity (K_E) to said electrical input signal (U_D);

(b) an amplifier, said amplifier being adapted to receive said electrical output signal of said magnetic sensing device (U_{in}) and amplify said electrical output signal of said magnetic sensing device (U_{in}) by an amplification factor (K_V) to produce an amplified output signal (U_O).

(c) a potentiometer, said potentiometer being adapted to

receive said amplified output signal (U_O) and damp said amplifier output signal (U_O) by a damping factor (K_D) to produce said electrical input signal (U_D) Wherein $U_D = U_O K_D$ and

(d) feedback means for connecting said potentiometer to said electrical control input of said magnetic field sensing device, so that said magnetic field sensing device can receive said input signal (U_D) from said potentiometer,

said magnetic field sensing device, said amplifier and said potentiometer being adapted so that the product of

(i) the sensitivity (K_E) of said magnetic field sensing device to said electrical input signal (U_D);

(ii) the amplification factor (K_V) of said amplifier; and

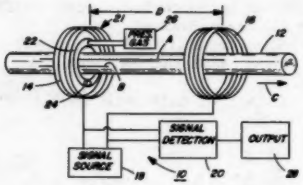
(iii) the damping factor (K_D) of said potentiometer, is much greater than unity, so that said amplifier output signal (U_O) is substantially linearly related to said magnetic field intensity.

4,683,430

EDDY CURRENT FLAW DETECTOR METHOD AND APPARATUS HAVING A ROTATABLE HIGH PERMEABILITY FLUX CONCENTRATOR ENCIRCLING A WORKPIECE

Richard M. Harris, North Royalton, and Richard F. Abramczyk, Brunswick, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jun. 27, 1984, Ser. No. 625,033
Int. Cl.[4] G01N *27/82*; G01R *33/12*
U.S. Cl. 324—241 **5 Claims**



1. Eddy current test apparatus for detecting flaws in a workpiece comprising:

two differentially wound conductive coils coaxial with each other and spaced along a workpiece path of travel for detecting the presence of flaws in said workpiece as said workpiece passes through said coils;

excitation circuitry coupled to said coils for exciting said coils with an electrical signal to induce eddy currents at spaced locations beneath said coils;

detection circuitry for monitoring eddy currents in the workpiece at the spaced locations beneath said coils and for correlating changes in said eddy currents with flaw locations in the workpiece; and

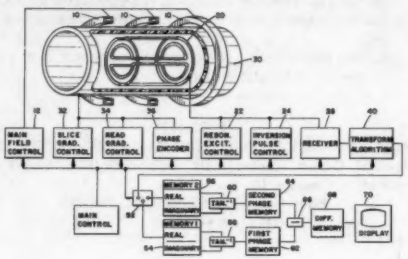
field altering means mounted in close proximity to one of said detection coils to distort a magnetic field at changing locations along a workpiece surface of interest, said field altering means including an enclosed annular track that encircles the workpiece path near the workpiece surface of interest, a ball having a high magnetic permeability positioned within the enclosed annular track, and a source of pressurized fluid coupled to an interior of the enclosed annular track to drive said ball about said workpiece path.

4,683,431

MAGNETIC RESONANCE IMAGING OF HIGH VELOCITY FLOWS

Pradip M. Pattany, Willoughby, Ohio, and Graham L. Nayler, Oxon, United Kingdom, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Aug. 16, 1985, Ser. No. 766,757
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—306 **22 Claims**



19. A magnetic resonance apparatus for examining moving substances, the apparatus comprising:

a main magnetic field control means for generating a generally uniform magnetic field through an image region;

at least one coil for transmitting and receiving radio frequency signals, the coil being disposed adjacent the image region;

a resonance excitation control means for selectively causing the coil to transmit a resonance excitation pulse;

an inversion pulse control means for selectively causing the coil to transmit a spin inversion pulse;

a receiving means for receiving a radio frequency resonance signal received by from the coil;

a gradient coil means for selectively causing magnetic field gradients across the main magnetic field;

a slice selection gradient means for selectively causing the gradient coil means to generate gradients for selecting a slice through the image region to be imaged;

a read gradient control means for selectively causing the gradient coil means to generate a read gradient across the slice;

a phase encoder means for selectively causing the gradient coil means to phase encode resonating nuclei in the selected slice;

a transform means for selectively transforming the resonance signal from the receiving means into an image representation which has real and imaginary values corresponding to each of a plurality of pixels;

a first memory means for storing real and imaginary portions of a first image representation which is produced when the slice selection gradient control means and the read gradient control means apply slice selection and read gradients in such a manner that an effective first moment in time in the selected slice is substantially zero;

a second memory means for storing real and imaginary portions of a second image representation which is produced when at least one of the slice selection gradient control means and the read gradient control means flow encodes resonating nuclei in the selected slice by shifting at least one of the respective slice selection and read gradients;

a phase determining means for determining a phase map whose intensity values vary with phase shift, the phase determining means being operatively connected with the first and second memory means for determining at least first and second phase maps from the first and second images;

a first and second phase map memory means for storing the

first and second phase maps, the phase map memory means being operatively connected with the velocity determining means, and;

a difference means for substractively combining the first and second phase maps to correct for any stationary artifacts the difference means being operatively connected with the first and second phase map memory means.

4,683,432

NUCLEAR MAGNETIC RESONANCE METHODS AND APPARATUS

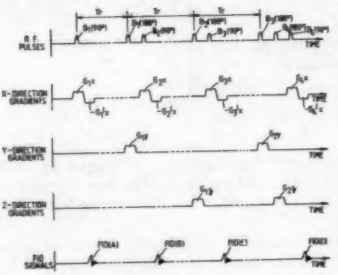
Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International, Inc., Wembley, England

Filed Sep. 18, 1986, Ser. No. 908,576

Claims priority, application United Kingdom, Sep. 25, 1985, 8523673

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **5 Claims**



1. A method of examining a predetermined location in a body using NMR techniques comprising: carrying out four separate procedures each comprising exciting spins in a region of the body including said predetermined location and acquiring and processing data in respect of said spins, the procedures differing in that in a first procedure the excited spins are of the same phase throughout said region, in a second procedure the excited spins are of a first phase in a first portion of said region of which said predetermined location forms part and of the opposite phase in the rest of said region, in a third procedure the spins are of a first phase in a second portion of said region which intersects said first poriton at said predetermined location and are of the opposite phase in the rest of said region, and in fourth procedure the spins are of a first phase in the first and second poritons, excluding said predetermined location, and are of the opposite phase in the rest of said region; and combining the processed data obtained in said four procedures to extract processed data relating to said predetermined location only.

4,683,433

IMAGING METHOD AND APPARATUS USING NUCLEAR MAGNETIC RESONANCE

Etsuji Yamamoto, Hachioji; Hideki Kohno, Suginami; Masao Kuroda, Nakano; Shigeru Matsui, Koganei, and Hidemi Shiono, Akigawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1984, Ser. No. 636,995

Claims priority, application Japan, Aug. 15, 1983, 58-148081

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **8 Claims**

6. An imaging apparatus using nuclear magnetic resonance, comprising:

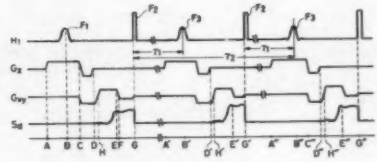
means for generating a static field;

means for generating gradient fields along three directions perpendicular to each other so as to produce field gradients along said three directions on said static field;

means for generating an RF magnetic field for superposition on said static field;

means for detecting the nuclear magnetic resonance signal from nuclear spins in an object to be imaged lying within said static field; and

sequence control means for sequentially controlling said gradient fields generating means said RF magnetic field generating means, and said detecting means to generate a



nuclear magnetic resonance signal plural times by excitation of the nuclear spins of said object and to rotate the direction of the nuclear spins of said object to the direction opposite to that of an equilibrium state and maintaining the opposite direction after the equilibrium state excitation of the nuclear magnetic resonance signals for the plural times so as to obtain a spin density distribution image and a relaxation time enhanced image.

4,683,434

METHOD FOR HOMOGENIZING THE FIELD OF A MAGNETIC COIL AND APPARATUS THEREFOR

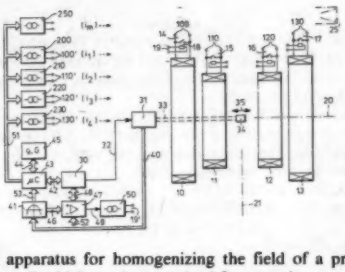
Werner Tschopp, Forch, Switzerland, assignor to Spectrospin AG, Fallanden/Zurich, Switzerland

Filed Mar. 24, 1986, Ser. No. 843,216

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511303

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—320 **8 Claims**



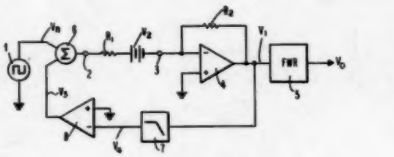
7. An apparatus for homogenizing the field of a primary magnetic coil which can be energized from a primary current source and operated in a superconductive manner and short-circuited by means of superconducting switches, comprising a magnetic field measuring device having a sensor which can be traversed along an axis of said coil and further comprising coil windings in addition to said primary coil, wherein said coil windings are designed in the form of supplementary coils with superconducting switches, said supplementary coils being able to be operated in a superconductive manner and separately from said primary coil, wherein said supplementary coils are connected with a current source, wherein an output of said magnetic field measuring device is connected with a field profile memory, and wherein said field profile memory and a control unit are connected with a processor, whose outputs are connected with a gradient memory, as well as with said primary current source and said current source for said supplementary coils.

4,683,435

CIRCUIT FOR COMPENSATING NON-LINEARITIES IN ELECTROLYTE CONDUCTIVITY MEASUREMENT SYSTEM

Frederick K. Blades, Boulder, Colo., assignor to Anatel Instrument Corporation, Boulder, Colo.

Filed Jan. 9, 1985, Ser. No. 689,871
Int. Cl.[4] G01N *27/06*
U.S. Cl. 324—442 4 Claims



1. A circuit for measuring the resistance of an electrolyte cell comprising a pair of electrodes, said cell being juxtaposed to a source of high-frequency noise, comprising:

oscillator means, for supplying a relatively low-frequency AC excitation signal V_R, connected to one of said electrodes;

first filter means, connected to the other of said electrodes, for receiving and filtering a major component of said noise from an AC output signal from said cell, said filter introducing a nonlinearity into said AC output signal,

current-to-voltage converter means connected to said filter means, for generating an output signal V_1, having an AC component proportional to the resistance of the cell and to the excitation signal V_R, and a DC component V_2;

a feedback loop comprising an integrator for generating a DC compensation signal equal to the DC component V_2 of V_1, said integrator introducing an AC nonlinearity into said output signal, wherein said first filter means and said integrator are chosen such that said AC nonlinearities are equal and opposite in sign; and

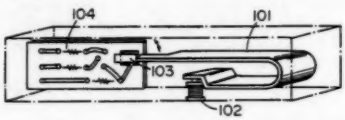
means for summing said DC compensation signal with said AC input signal V_R.

4,683,436

SURFACE POTENTIAL ELECTROMETER AND IMAGE FORMING APPARATUS USING THE SAME

Koji Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 418,024, Sep. 14, 1982, abandoned, which is a continuation of Ser. No. 141,885, Apr. 21, 1980, Pat. No. 4,367,948. This application Mar. 21, 1985, Ser. No. 714,574
Claims priority, application Japan, Apr. 24, 1979, 54-51141; Apr. 28, 1979, 54-52632; Apr. 28, 1979, 54-52633; May 8, 1979, 54-56536; Jun. 25, 1979, 54-79860; Jul. 10, 1979, 54-87118
Int. Cl.[4] G01R *29/12*
U.S. Cl. 324—458 9 Claims



1. A surface potential electrometer, comprising:

a measuring electrode arranged to be shielded from an external electric field produced by a test element except by way of an aperture through which in use said electrode can be exposed to a said electric field;

a chopper arranged to be vibrated so as to intersect cyclically the lines of electric force extending from the test element to the measuring electrode through the aperture;

an amplifier circuit for converting an AC signal outputted from said measuring electrode into a low impedance signal; and

a printed circuit board on which said measuring electrode and said amplifier circuit are provided;

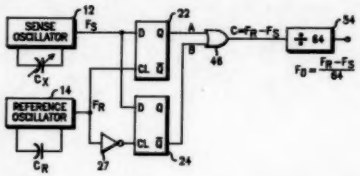
wherein said measuring electrode on said printed circuit board is a planar element disposed in a fixed position with respect to vibratory movement of said chopper.

4,683,437

FREQUENCY SUBTRACTOR

Rupin J. Javeri, Elk Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1986, Ser. No. 871,228
Int. Cl.[4] H03D *13/00*
U.S. Cl. 328—133 11 Claims



11. A subtractor for developing an output signal that is representative of the frequency difference between a first signal and a second signal that has leading and trailing edges, comprising:

first means for sampling the first signal upon the occurence of each leading edge of the second signal so as to develop a first binary signal whose state depends on the sampled state of the first signal;

second means for sampling the first signal upon the occurence of each trailing edge of the second signal so as to develop a second binary signal whose state depends on the sampled state of the first signal; and

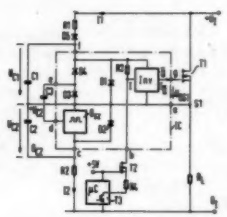
means for logically ORing the first and second binary signals to develop the output signal.

4,683,438

CIRCUIT FOR CONNECTING A LOAD TO THE HIGH SIDE OF A DC POWER SUPPLY

Alfred Hauenstein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,488
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516936
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—288 10 Claims



1. A circuit for connecting a load to a high side of a DC power supply, comprising:

an n-channel MOSFET between said high side and said load;

a first RC network containing a first capacitor, said first RC network being in parallel with the drain-source path of the MOSFET;

a second RC network containing a second capacitor, said second RC network being in parallel with the load and connected such that the first and second capacitors are connected together;

an inverter with an input connected to that plate of the first capacitor which is unconnected to the second capacitor and with an output connected to the gate of the MOSFET; and

means for trickle-charging said first capacitor.

4,683,439

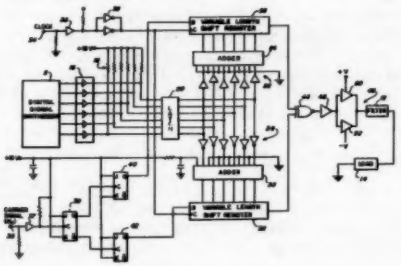
DIGITALLY DRIVEN SWITCHING POWER AMPLIFIER SYSTEM

Jay W. Atherton, Seattle; Raymond A. Castor, Redmond; Leonard F. Christie, Edmonds, and Robert C. Engerman, Seattle, all of Wash., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 9, 1986, Ser. No. 817,384

Int. Cl.[4] H03F *3/38*

U.S. Cl. 330—10 **11 Claims**



1. A signal control circuit including a digital power amplifier, said power amplifier comprising:

a source of digital signals representative of successive values of a predetermined signal train;

a digital symmetrical pulse width modulating means for producing a succession of symmetrically pulse width modulated output signals;

connecting means coupling said source of digital signals to said modulating means to control said modulating means in accordance with the digital signals from said source;

said digital symmetrical pulse width modulating means including:

latch means connected to said source of digital signals for holding at the output thereof each of said successive values of digital signals from said source;

a first and a second controllabe delay shift register having an input connection, an output connection, and control input connections,

first coupling means connected between said output of said latch means and said control input connections of said first shift register to apply said successive values directly to said control input connections,

second coupling means connected between said output of said latch means and said control input connections of said second shift register to apply said successive values inversely to said control input connections of said second shift register,

digital input signal means connected to apply digital input signals to said input connections of said first and second shift register,

combining means connected to said output connection means of said first and second shift registers to provide a resultant symmetrically pulse width modulated digital output signal from said combining means; and

switching amplifier means coupled to said modulating means to amplify said pulse width modulated output signals.

4,683,440

HIGH-FREQUENCY AMPLIFIER DEVICE

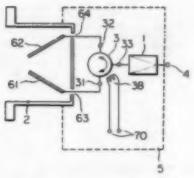
Yoshihiko Yoshikawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,159

Claims priority, application Japan, Feb. 28, 1985, 58-39079

Int. Cl.[4] H03F *3/60*

U.S. Cl. 330—51 **3 Claims**



1. A high-frequency amplifier device comprising a high-frequency amplifier portion, a high-frequency input portion which is formed of a waveguide and which can transmit polarized signals orthogonal to each other, two detector portions which are inserted in said waveguide of said input portion and which independently detect the polarized wave signals orthogonal to each other, respectively, an irreversible circuit to which the polarized wave signals detected by said detector portions are individually input and which selectively and switchingly delivers one of the polarized wave signals to said high-frequency amplifier portion and returns the other polarized wave signal to the input portion, and switching control means to switch and control transmitting directions of said irreversible circuit in response to a control signal externally applied, whereby the two orthogonal polarized wave signals can be switched and amplified.

4,683,441

APPARATUS FOR ESTABLISHING THE DIFFERENCES BETWEEN MULTIPLE PAIRS OF ANALOG INPUT SIGNALS

Thomas K. Naylor, Belmont, Mass., assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,621

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—69 **19 Claims**

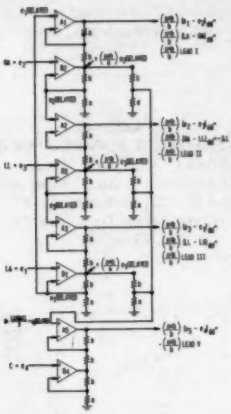
11. Apparatus for establishing the differences between multiple time-coincident pairs of analog input signals with a minimum number of active devices comprising:

a bank of differential amplifier circuits limited in number to the number of pairs of signals for which the differences between pairs is sought, each of said differential amplifier circuits having at least one high impedance input terminal and a low impedance output;

means within each of said differential amplifier circuits for generating a delayed version of an input signal thereto; and

means for applying said delayed version of an input signal from each differential amplifier circuit to the high impedance input terminal of another differential amplifier circuit, whereby each differential amplifier circuit is sup-

plied with one properly delayed input signal from another differential amplifier circuit where it is subtracted from



the delayed version of the input signal applied directly to this differential amplifier circuit.

4,683,442

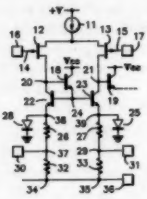
OPERATIONAL AMPLIFIER CIRCUIT UTILIZING RESISTORS TRIMMED BY METAL MIGRATION

Robert L. Vyne, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 662,109, Oct. 18, 1984, Pat. No. 4,606,781. This application Apr. 28, 1986, Ser. No. 856,258

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—261 **9 Claims**



9. A circuit formed in a semiconductor substrate, comprising:

transistor means having base, emitter and collector terminals, and having a base-emitter conduction path, said emitter coupled to a first supply voltage conductor;

diode means coupled in parallel with said base-emitter conductor path; and

a first RTMM resistor coupled between said diode means and said supply voltage conductor.

4,683,443

MONOLITHIC LOW NOISE AMPLIFIER WITH LIMITING

James P. Young, Cedar Rapids; Robert J. Weber, Marion, both of Iowa, and G. Robert Kaelin, Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1986, Ser. No. 822,579

Int. Cl.[4] H03F *1/52, 3/16*

U.S. Cl. 330—277 **4 Claims**

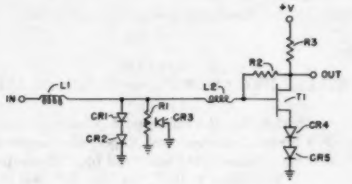
2. A low noise amplifier comprising:

a positive voltage source;

a transistor which receives an input signal over its gate terminal, is connected to the positive voltage source with its drain terminal, and has a source terminal connected with a common electrical ground;

a biasing circuit which electrically connects the transistor to the positive voltage source and the common electrical ground, said biasing circuit providing a forward bias to the transistor;

a means for limiting high input voltages from entering the transistor, said limiting means being electrically connected with the biasing circuit and the transistor; and



first and second inductor coils, being connected in series with each other and conducting input signals into the gate terminal of the transistor, said first and second inductor coils being connected to the common electrical ground by the biasing circuit and limiting means, said first and second inductor coils together with impedance in the limiting means and biasing circuit simulating a shunt capacitor which connects the transistor's gate terminal with the common electrical ground, said first and second conductor coils thereby providing input impedance matching between the low noise amplifier and the input signals.

4,683,444

GENERATOR CIRCUIT FOR GENERATING TWO SINUSOIDAL SIGNALS WITH A PHASE DIFFERENCE OF 90 DEGREES

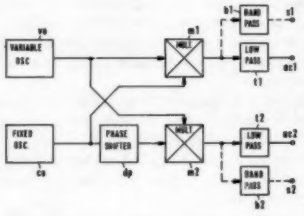
Otmar Kappeler, Neuenburg, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 810,610

Claims priority, application European Pat. Off., Dec. 14, 1984, 84 11 5450.3

Int. Cl.[4] H03B *21/02;* **H03L** *7/18*

U.S. Cl. 331—25 **5 Claims**



1. A generator circuit for generating first and second jointly frequency-variable sinusoidal signals which are phase shifted by 90° in relation to one another, comprising:

a first analog multiplier;

a 90° phase shifter;

a main oscillator;

a fixed frequency divider coupled to said main oscillator, and a third low-pass filter whose cutoff (limit) frequency lies below the output signal frequency of said fixed frequency divider, said third low-pass filter coupled to the output of said fixed frequency divider and to the input of

said 90° phase shifter and to a first input of said analog multiplier;

a second analog multiplier having a first input connected to the output of said 90° phase shifter;

a variable frequency divider coupled to said main oscillator, and whose number of divisions is determined by digital data and having its output coupled to a second input of said first multiplier and to a second input of said second multiplier;

a first low-pass filter coupled to the output of said first multiplier, the output of said first low-pass filter providing said first sinusoidal signal;

a second low-pass filter coupled to the output of said second multiplier, the output of said second low-pass filter providing said second sinusoidal signal; and wherein

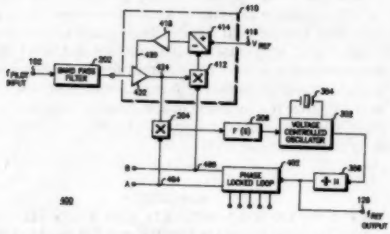
the upper cutoff frequencies of said first and second low-pass filters lie between the sum and the difference of the frequencies of the signals provided by said fixed frequency divider and of said variable frequency divider.

4,683,445

SYNCHRONIZATION METHOD FOR DERIVING A REFERENCE SIGNAL FROM A PILOT FREQUENCY

Paul M. Erickson, Hanover Park, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Apr. 30, 1986, Ser. No. 858,323
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—25 **24 Claims**



1. Synchronization apparatus for deriving a stable reference signal from a selected pilot frequency which is embedded among other signal information inputted thereto, the apparatus forming a loop comprising in combination:

controlled oscillator means for generating an output signal whose frequency is a harmonic of the desired reference signal and proportional to a control signal applied thereto;

programmable means for multiplying the frequency of said output signal by a given preset factor to generate an injection signal therefrom; and

linear means for comparing the phase difference between the selected pilot frequency and said injection signal, thereby producing a control signal at baseband to rapidly phase-lock the controlled oscillator means to the selected pilot frequency in accordance with said given preset factor of said programmable means.

4,683,446

PRF COHERENT, PULSED OSCILLATOR APPARATUS

Thomas W. McDonald, San Juan Capistrano, Calif., assignor to Cartwright Engineering, Inc., Anaheim, Calif.

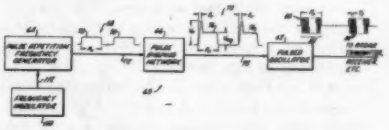
Filed Jun. 12, 1985, Ser. No. 743,799
Int. Cl.[4] H03K *7/08*
U.S. Cl. 331—47 **15 Claims**

1. Phase-locked, pulsed oscillator apparatus which comprises:

(a) a pulse repetition frequency (PRF) generator having pulse output signals of a frequency, f_1, with an associated period, T_1, equal to $1/f_1$;

(b) a pulsed oscillator having a free running frequency, f_{FR}, which is approximately equal to N times the PRF generator output signal frequency, f_1, wherein N is an integer; and

(c) pulse shaping means connected for receiving the PRF generator output signals and for shaping thereof into reshaped pulses having a sharp rise time, t_r, selected to impart significant harmonic power to the reshaped pulses



near the free running frequency of the pulsed oscillator, said pulse shaping means being connected to the pulsed oscillator and providing said reshaped pulses thereto for causing triggering on of the pulsed oscillator,

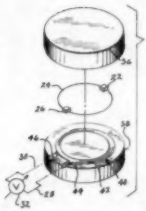
whereby the pulsed oscillator is caused to have pulse-to-pulse consistency such that each oscillator output pulse bears the same phase relationship to the reshaped pulses as does any other of said oscillator output pulses.

4,683,447

VARACTOR TUNING CIRCUIT FOR DIELECTRIC RESONATOR STABILIZED OSCILLATOR

Ashok K. Talwar, Westlake Village; William E. Poole, Jr., Newbury Park, and Richard B. Steinkolk, Sherman Oaks, all of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 1, 1986, Ser. No. 936,228
Int. Cl.[4] H03J *3/18*
U.S. Cl. 331—177 V **4 Claims**



1. A tuning varactor circuit for a dielectric resonator stabilized oscillator, comprising a varactor diode electrically connected in an electrically conductive loop with an RF bypass capacitor and having a pair of terminals for applying bias voltage across said diode, and first and second dielectric resonator substrates facing each other along the plane of said loop, with said loop therebetween.

4,683,448

HIGH SENSITIVITY INTERFERENTIAL ELECTRO-OPTICAL MODULATOR

Christian Duchet, Marcoussis, and René Martin, Massy, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Jan. 9, 1985, Ser. No. 689,902
Claims priority, application France, Jan. 18, 1984, 84 00734
Int. Cl.[4] H01S *1/00;* **G02B** *5/14*
U.S. Cl. 332—7.51 **5 Claims**

1. High sensitivity, interferential electro-optical modulator including a modulator input and output comprising:

a Mach-Zehnder integrated type interferometer (13), said interferometer comprising:

a platelet (**18**) having a face and being of transparent crystalline material whose optical index varies by electro-optical effect under the action of an electrical field;

integrated input and output optical guides, said guides being formed in said face of said platelet through permanent localized increases in the optical index resulting from doping of the material, said guides being monomode both as to their width and thickness and format;

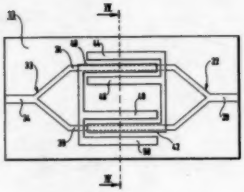
said input guide (**20**) receiving from said modulator input and conducting a light with space coherence;

an optical input junction in Y form integrated with said input guide and separating the light from the input guide into two beams of same intensity;

two interferometer arms (**24, 26**) integrated with said input junction and being of similar length conducting the two beams thus separated, said two arms extending parallel to each other in a longitudinal direction;

an optical junction in Y form (**21**) integrated with said interferometer arms to recombine the two beams from the two arms;

said output guide (**34**) integrated with said output junction and receiving the light thus recombined and transmitting it on output (**9**) from the modulator, the length of said output guide being such that it only transmits its fundamental mode;



said modulator further containing electrodes formed on said face of the platelet, associated with the two interferometer arms and means for applying an electrical modulation signal to the material of said two arms (**24, 26**) to create two electrical fields varying the optical length of said two arms in opposite directions thus modulating the intensity of the light transmitted by the output guide (**34**), said electrodes extending along said longitudinal direction over practically the whole length of the arms to increase the sensitivity of the modulator, one of the electrodes associated with each of said arms being an overlapping electrode which overlaps each said arm so that the electrical field applied to each said arm is practically perpendicular to said face of the platelet, the other electrodes being lateral electrodes formed at a lateral distance from said arms;

the improvement wherein said modulator contains six said electrodes, each arm being associated with three electrodes which are; an overlapping electrode fitted between two lateral electrodes, said modulation signal being aplied between firstly said overlapping electrode and secondly said two lateral electrodes so that the electric field applied to each arm is made practically uniform over the whole of its width to still further increase sensitivity of the modulator.

4,683,449

NOISE REDUCTION COMPRESSION SYSTEM CONTROLLED BY COMPRESSED OUTPUT COMPONENTS WHICH ARE IN-BAND

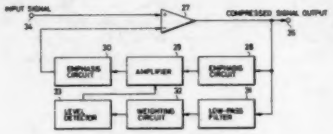
Shigeru Kato, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,781

Claims priority, application Japan, May 2, 1984, 59-89091; May 2, 1984, 59-89092

Int. Cl.[4] H04B *1/64*; H03G *7/00*

U.S. Cl. 333—14 **2 Claims**



1. A compression circuit for a noise reduction system coupled to a bandwidth-limited transmission system having a transmission band defined by bandwidth limitations, said circuit receiving and compressing an input signal to provide a compressed output signal to said transmission system, said circuit comprising subtraction means for subtracting a feedback signal from said input signal to obtain said compressed output signal, a controllable gain amplifier for processing said compressed output signal in accordance with a control signal to obtain said feedback signal, a low-pass filter having a pass band substantially the same as said transmission band of said transmission system, said filter receiving said compressed output signal and providing a filter output; and level detector means responsive to said filter output for providing said control signal to said controllable gain amplifier, whereby the gain of said amplifier is controlled in accordance only with components of said compressed output signal within the bandwidth of said transmission system.

4,683,450

LINE WITH DISTRIBUTED LOW-PASS FILTER SECTION WHEREIN SPURIOUS SIGNALS ARE ATTENUATED

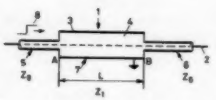
Jean-Joseph Max, Neuchatel, and Arvind Shah, Cormondreche, both of Switzerland, assignors to Feller AG, Horgen, Switzerland

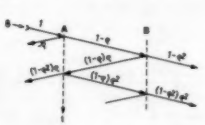
Filed Jun. 29, 1983, Ser. No. 509,217

Claims priority, application Switzerland, Jul. 1, 1982, 4021/82

Int. Cl.[4] H01P *1/201*

U.S. Cl. 333—202 **11 Claims**





1. An electrical transmission line comprising an elongated main conductor of low resistivity and including first and second line sections, each section including a segment of the main conductor and each section having a predetermined characteristic impedance; and

a distributed low-pass filter comprising a third line section connected in series between the first and second line sec-

tions, the third line section including a main conductor segment interconnecting the main conductor segments of the first and second line sections,

the third line section having a characteristic impedance substantiallly different from the characteristic impedance of either one of the first and second line sections so that high frequency spurious signals occurring on the transmission line are repetitively reflected back and forth within the third line section, and

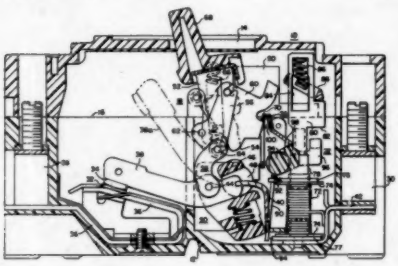
the third line section having a layer of non-magnetic conductive material, having a resistivity many times higher than the resitivity of the main conductor segment of the third line section, encompassing the main conductor segment of the third line section, affording substantial losses for such high frequency spurious signals so that such signals are highly attenuated as they are reflected within the third line section.

4,683,451

CIRCUIT BREAKER WITH TRIP DELAY MAGNETIC CIRCUIT

Kurt A. Grunert, Beaver Boro, and Alfred E. Maier, Chippewa, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1986, Ser. No. 839,484
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—174 **2 Claims**



1. A circuit breaker comprising:

a pair of separable contacts including a movable contact;

a movable contact arm carrying the movable contact and movable between open and closed positions of the contacts;

an operating mechanism for actuating the contact arm and comprising a pivotally supported releasable member;

latching means for latching the releasable member and including a latch lever movable between latched and unlatched positions of the releasable member;

trip means including a trip bar for releasably holding the latch lever in the latched position;

trip delay means for avoiding premature unlatching of the trip bar and including first electromagnetic means including a first armature and second electromagnetic means including a second armature and a solenoid coil; the first armature being movable preliminary to operation of the second armature in response to an overcurrent below a predetermined overcurrent condition; and

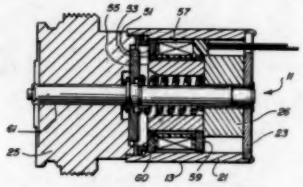
the second electromagnetic means also including a magnetic frame having opposite end portions each disposed at opposite ends of the coil and including the second armature pivotally mounted on one end portion and movable into and out of contact with the other end portion in response to a magnetic force, so as to enhance the electromagnetic force acting on the second armature.

4,683,452

BI-STABLE ELECTROMAGNETIC ACTUATOR

Lester P. Henley, Stickney, Ill., assignor to Regdon Solenoid, Inc., Brookfield, Ill.

Filed Jun. 30, 1986, Ser. No. 879,894
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—234 **6 Claims**



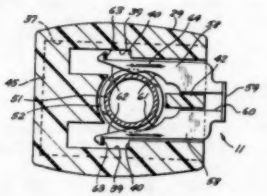
1. A bi-stable electromagnetic actuator comprising: a housing; an armature disposed in said housing and being moveable between first and second predetermined positions; a retractable linkage member disposed in said housing in sliding engagement with said armature, said linkage member including a portion which projects out of said housing to allow manual advancement of said linkage between said first and second locations and a stop which the armature engages to move said linkage from said first to said second position; magnetic means for retaining said armature in said first stable position; coil means for reducing the net flux through said armature; advancing means for advancing said armature from said first to said second stable positions when said coil means reduces the net flux through said armature; and a biasing member secured to said linkage, said biasing member disposed within the magnetic field of said magnetic means to bias said linkage and maintain said linkage in abutting relation with said armature.

4,683,453

SOLENOID ACTUATOR WITH FASTENER

David J. Vollmer, Ironia, and James E. Greame, Long Valley, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Nov. 25, 1985, Ser. No. 801,466
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—255 **11 Claims**



1. A solenoid actuator comprising:

a coil of electrically conductive wire wound about an axis,

an enclosure for the coil,

receptacle means carried by the enclosure for accommodating a mounting member of a device to be controlled by the solenoid actuator,

a slideway carried by the enclosure extending transverse to the coil axis,

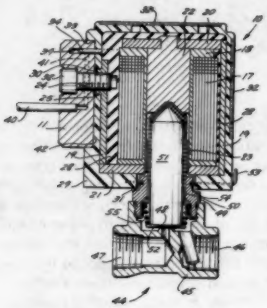
a fastener movable within the slideway between a latched position in which it can engage the mounting member, to secure the enclosed coil to the device to be controlled, and an unlatched position in which it is disengaged from the mounting member, to permit separation of the enclosed coil from the device to be controlled, and

means for preventing separation of the fastener and the enclosure when the fastener is in its unlatched position.

4,683,454
SOLENOID ACTUATOR WITH ELECTRICAL CONNECTION MODULES

David J. Vollmer, Ironia, and James E. Greame, Long Valley, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Oct. 31, 1985, Ser. No. 793,208
Int. Cl.[4] H01F *15/10, 27/04*
U.S. Cl. 335—299 **14 Claims**



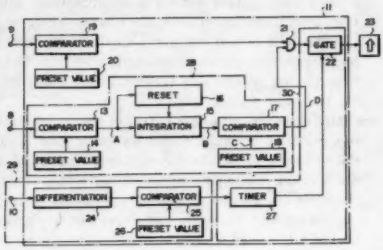
1. A solenoid actuator comprising:
a coil of electrically conductive wire,
a yoke of magnetic material surrounding the coil,
a non-electrically and non-magnetically conductive material encapsulating the coil and yoke,
a pair of terminals connected to the ends of the coil and projecting outwardly beyond an exterior surface of the encapsulation,
an electrical connection module having means for receiving the coil terminals, means for connecting the module to a source of electric power, and means within the module for electrically connecting the coil terminals to the electric power connecting means, and
means for fastening the module to the encapsulated coil and yoke, the fastening means including attachment means carried by the yoke, and a fastener cooperable with the attachment means for securing the module to module to the yoke, the encapsulating material having an opening for permitting access to the attachment means.

4,683,455
SHIFTING TIMING INDICATING SYSTEM FOR A VEHICLE

Yoshinobu Kido, and Toshihiro Yamada, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jul. 1, 1985, Ser. No. 750,511
Claims priority, application Japan, Jul. 4, 1984, 59-138577
Int. Cl.[4] B60Q *1/00;* **G08B** *9/04*
U.S. Cl. 340—52 R **11 Claims**

1. A shifting timing indicating system for a vehicle comprising a control means having an engine rpm detecting means for detecting the engine rpm and a rpm determination means which receives the output of the engine rpm detecting means and determines whether the engine rpm exceeds a preset value, the control means outputting a shift-up signal when the engine rpm exceeds the preset value, and a shift-up indicating means which receives the shift-up signal from the control means and makes a shift-up indication to direct the operator of the vehicle to shift up, wherein the improvement comprises an engine load detecting means for detecting the engine load; an acceleration detecting means responsive to said engine load detecting means to detect the rate of increase in engine load and restricting means responsive to said acceleration detecting means to inhibit the shift-up indicating means from making the shift-up

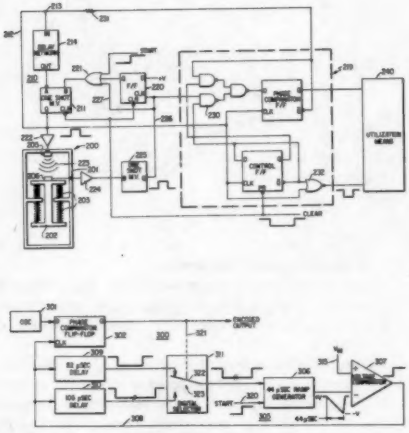


indication when the rate of increase in engine load is greater than a predetermined positive value.

4,683,456
METHODS AND APPARATUS FOR ANALOG TO DIGITAL CONVERSION

Robert G. Nelson, Dallas, Tex., assignor to Timeback Systems, Inc., Dallas, Tex.

Filed Dec. 28, 1983, Ser. No. 566,314
Int. Cl.[4] A03K *13/20;* **G01P** *15/08*
U.S. Cl. 340—347 AD **49 Claims**

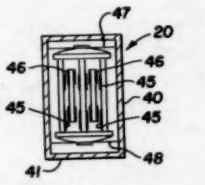


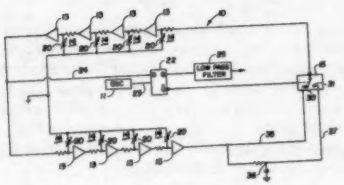
10. A system for digitizing a representation of an analog condition comprising:
(a) two means for generating time spaced digital pulse signals and whose frequencies are harmonically related one to the other, each said means comprising an oscillator;
(b) means responsive to a representation of said analog condition to effect a relative phase shift between said digital pulse signals;
(c) means for measuring said relative phase shift; both said digital pulse signals appearing at said measuring means having a constant frequency;
(d) means responsive to the measure of said relative phase shift to return said signals toward an in-phase relationship;
(e) means for producing a digital function representation of said measure of relative phase shift; and
(f) means for utilizing said digital function.

4,683,457
ANALOG TO DIGITAL CONVERTER

Robert G. Nelson, Dallas, and James D. Awtrey, Garland, both of Tex., assignors to Royalty Funding Ltd., Houston, Tex.

Continuation-in-part of Ser. No. 566,314, Dec. 28, 1983. This application Apr. 29, 1986, Ser. No. 857,028
Int. Cl.[4] A03K *13/20*; G01P *15/08*
U.S. Cl. 340—347 AD 13 Claims





1. An analog to digital converter comprising;
a source having an output of fixed frequency time spaced pulses,
means, including an oscillator comprised of a plurality of digital gates connected serially in a loop, and having an output of time-spaced pulses whose frequency is harmonically related to the output frequency of said source,
an impedance in said loop responsive to an analog condition to change the phase of said time-spaced pulses from said means,
a comparator,
means for applying the outputs of said source and said means to said comparator,
means responsive to said comparator to correct said time-spaced pulses from said means to an in-phase state relative to the time spaced pulses from said source, and
means for producing digital signals whose value is proportional to the correction made to said time-spaced pulses from said means.

4,683,458
CURRENT-STEERING DIGITAL-TO-ANALOG CONVERTER FOR PROVIDING BI-DIRECTIONAL CURRENTS THROUGH A LOAD

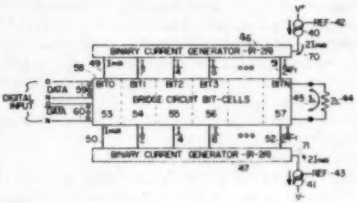
Robert Hallgren, 142 Cornell Quarters, Ithaca, N.Y. 14850

Filed Jul. 31, 1986, Ser. No. 891,129
Int. Cl.[4] H03M *1/80*
U.S. Cl. 340—347 DA 11 Claims

1. A digital-to-analog converter for converting a digital input signal comprising a binary encoded number having a plurality of data bits, the signal appearing at a digital signal input and its complement appearing at a complementary signal input, to a bidirectional analog current output representation of the digital input signal, the analog current output being adapted to supply current to a floating load at a first and second current output means, the digital-to-analog converter comprising:

(a) a plurality of bit-cell circuits, one for each data bit in the digital input signal, each bit-cell circuit comprising:

(1) a first current input;
(2) a second current input;
(3) a data bit input and a complementary data-bit input, the complementary data-bit input being the logical inverse of the data-bit input;
(4) first and second current output means for supplying current to a load;
(5) a bridge circuit comprising four controllable devices arranged in two pairs, each device having an input, an output, and control input means for activating the current flowing from the input to the output in response to a predetermined logical value at the control input;
(6) the inputs of the first pair of controllable devices being connected to the first current input;
(7) the outputs of the second pair of controllable devices being connected to the second current input;
(8) the output of one of the first pair of controllable devices and the input of one of the second pair of controllable devices being connected to each other and to the first current output means;
(9) the output of the other of the first pair of controllable devices and the input of the other of the second pair of controllable devices being connected to each other and to the second current output means;
(10) the control inputs of the two controllable devices whose input or output is connected to the first current output means being connected to the data-bit input;
(11) the control inputs of the other two controllable devices being connected to the complementary data-bit input;



(12) the controllable devices being chosen such that the logical value at the control input which activates the current flow in the two controllable devices whose inputs are connected to the first current input is the complement of the logical value which activates current flow in the two controllable devices whose outputs are connected to the second current input;

(b) a plurality of current source means for providing a regulated current of a given magnitude, arranged in pairs, one pair of current source means being associated with each bit-cell circuit, each pair of current source means comprising two current source means for supplying a plurality of currents of identical magnitude and opposite direction, one current source means of each pair being connected to the first current input of the bit-cell circuit with which the pair is associated, and the other current source means of the pair being connected to the second current input of the bit-cell circuit;

(c) the magnitude of the current provided by each pair of current source means except those associated with the bit-cell circuit for the most significant bit in the digital input signal, being chosen to be one-half that of that provided by the pair of current source associated with the bit-cell for the next most significant bit;

(d) the data bits of the input digital signal being connected to the data bit inputs of the bit-cell circuits, and the complementary signals of the data bits being connected to the complementary data bit inputs of the bit-cell circuits;

(e) the first current output means of each of the bit-cell circuits being connected together in parallel, and the

combination being then connected to the first current load output means of the digital-to-analog converter;

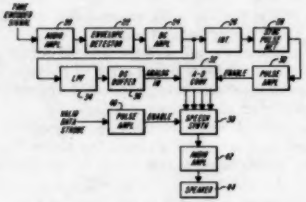
(f) the second current output means of each of the bit-cell circuits being connected together in parallel, and the combination being then connected to the second current load output means of the digital-to-analog converter.

4,683,459

ALARM SYSTEM TEST ANNUNCIATOR

James B. Edson, Concord, Mass., assignor to ADT, Inc., Parsippany, N.J.

Filed May 28, 1985, Ser. No. 738,576
Int. Cl.[4] G08B *29/00, 1/08*
U.S. Cl. 340—514 **7 Claims**



1. For use in a wireless alarm system having one or more transmitters each providing a coded transmitted signal representing status and alarm conditions, and a receiver for receiving each of the transmitted signals, test apparatus comprising:

first means operative in response to a signal from the receiver which is representative of signal strength to provide a first signal;

second means for providing a digital signal representative of the first signal;

speech synthesizer means;

means for providing the digital signal to the synthesizer means to cause the provision of an audio output signal representing a digit corresponding to the signal strength represented by the digital signal, said means for providing the digital signal being responsive to said coded transmitted signal; and

output means operative in response to the audio output signal to provide verbal annunciation of the digit represented by the audio output signal.

4,683,460

INTRUSION ALARM SYSTEM WITH AUTOMATIC EXIT CONTROL AND MISSET INDICATOR

Norihiko Nakatsugawa, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 22, 1985, Ser. No. 736,949
Claims priority, application Japan, May 25, 1984, 59-105961
Int. Cl.[4] G08B *13/08*
U.S. Cl. 340—545 **6 Claims**

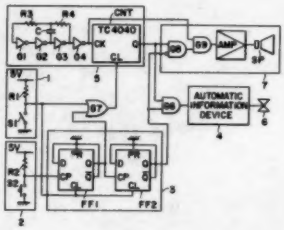
1. An intrusion alarm system comprising:

a mode selection circuit which selects a "Present" mode which represents the presence of a resident in a house, building, room or the like and an "Absent" mode which represents the absence of the resident from the house, building, room or the like, said mode selection circuit being set by the resident;

a door open/closed detection circuit which detects a door's being in an open state or a closed state;

a sequential circuit which operates while said mode selection circuit is set in the "Absent" mode and stores signals representative of the door being opened and then closed according to said door open/closed detection circuit, said sequential circuit detecting that the door was opened for a second time after the mode selection circuit is set in the "absent" mode, and producing an output signal upon the detection of the second door opening;

a misset alarm device which generates an alarm if an opening of the door is not detected by said door open/closed detection circuit within a predetermined time after said mode selection circuit is placed in the "Absent" mode;



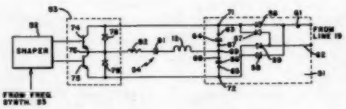
a timer circuit which starts counting upon said second door opening detected by said sequential circuit and produces an output signal upon expiration of a predetermined time as counted from the second door opening; and

an automatic information device which informs a security center of the detection of a trespasser when the output signal of the sequential circuit and the output signal of the timer circuit are both present.

4,683,461

INDUCTIVE MAGNETIC FIELD GENERATOR

John J. Torre, Monroe, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 17, 1985, Ser. No. 776,921
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—551 **19 Claims**

1. A power-line-activated inductive magnetic field generator having an on-duty cycle portion considerably less than 50% for deriving an AC magnetic field having a predetermined frequency comprising: a transformerless AC-power-line-to-DC converter, a series resonant circuit including coil means, and switch means activated during the on-duty cycle portions and deactivated during off-duty cycle portions, the switch means being activated at a selected frequency during the on-duty cycle portions and being connected to the resonant circuit as well as to the converter to cause resonant current to flow in the series circuit at the predetermined frequency during each on-duty cycle portion to thereby cause the coil means to derive the AC inductive magnetic field.

4,683,462

DEVICE FOR PROTECTING AUDIO EQUIPMENT IN VEHICLE AGAINST THEFT

Kazuma Takeda, and Tsutomu Igarashi, both of Iwaki, Japan, assignors to Alpine Electronics Inc., Japan

Filed Nov. 7, 1984, Ser. No. 669,103
Claims priority, application Japan, Nov. 8, 1983, 58-209471
Int. Cl.[4] G08B *13/14;* **G06F** *7/04;* **H04B** *11/16*
U.S. Cl. 340—571 **11 Claims**

1. In an audio equipment adapted to be installed in a vehicle and having an audio section for providing an audio sound

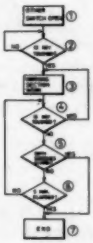
output, the improvement of said audio equipment being provided integrally with its own anti-theft device comprising:

an entry section including a plurality of keys for entering a selected number;

a storage section for storing a code number;

a power section for connecting said audio equipment including said anti-theft device to a battery when said audio equipment is installed in a vehicle;

control means connected to said entry section, storage section, and power section, which becomes operative upon connecting said power section to the battery of a vehicle, for receiving a number entered on said entry section and comparing said entered number to said code number stored in said storage section, and for providing a signal



indicating if said entered number and said stored code number match; and

a muting circuit for muting the audio section from providing an audio sound output or for releasing the audio section from a muted condition to an operative condition depending upon whether said signal is provided by said control means;

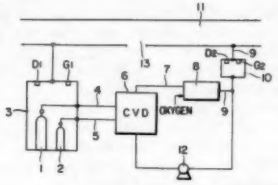
further including a second power section for receiving an operative voltage supplied to said anti-theft device when a power switch in the vehicle is switched on, said control means including a detector for detecting if said second power section is not provided with the operative voltage and if a key of said entry section is depressed, and a warning section connected to said control means which provides a warning signal if both said conditions are detected.

4,683,463

GAS AND FIRE ALARM AND CONTROL SYSTEM FOR SEMICONDUCTOR FACTORIES OR THE LIKE

Shoichi Kimura, Tokyo, Japan, assignor to Nohmi Bosai Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 581,972, Feb. 21, 1984, abandoned.
This application Oct. 3, 1986, Ser. No. 914,529
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—629 **3 Claims**



1. An alarm and control system for semiconductor factories or the like having an exhaust system wherein treatment gases including silane gas are used in the manufacturing process of semiconductors, comprising: gas detecting means to detect the leakage of said treatment gases including silane gas, and fire detecting means to detect products of combustion of said treatment gases, which include silane gas, provided at locations where said treatment gases, including silane gas, are used; said fire detecting means consisting of an ionization-type smoke detector; said gas detecting means, provided at the locations where said treatment gases are used, utilize a metal oxide semiconductor containing platinum black as a detecting element for detecting the leakage of said treatment gases, including silane gas, and any said metal oxide semiconductor used as said detecting element, which contains said platinum black, is aged in an atmosphere of silane gas; said gas detecting means and said fire detecting means having circuitry means which, upon a change in the output stage of either of said metal oxide semiconductor or said fire detecting means, causes an alarm signal to issue; and means responsive to said alarm signal connected to control a protection device such as a fire extinguishing device as well as said manufacturing process of semiconductors or the like.

4,683,464

SAFETY MONITOR MEANS AND METHOD

Chew-Chen Lin, Houston; Winthrop K. Brown; Frank L. Lankford, Jr., both of Bellaire; Katherine L. Greenhill, Houston, and Ronald L. Campsey, Alief, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 509,106, Jun. 30, 1983, abandoned.
This application Jan. 23, 1986, Ser. No. 821,711
Int. Cl.[4] G08B *13/26, 21/00*
U.S. Cl. 340—685 **12 Claims**

1. An automatic safety monitor for use with apparatus having a conductive member, said apparatus changes the attitude and/or altitude of the conductive member during operation of the apparatus, comprising:

antenna means mounted on the conductive member for sensing an electric field and providing an AC signal representative of the strength of the electric field,

means for averaging the peaks of the AC signal over several cycles to provide an average peak signal,

means connected to the averaging means for providing a reference signal derived from either the average peak signal prior to a change in the member's attitude and/or altitude or while the apparatus is changing the member's attitude and/or altitude, and

alarm means connected to said averaging means and to the reference signal means for providing an alarm to the operator of apparatus so that the operator may prevent further changing of the conductive member's attitude and/or altitude, said alarm means provides said alarm in accordance with the average peak signal and the reference signal when the electric field strength is substantially greater than a safe value.

9. A method for safely changing the attitude and/or altitude of a conductive member in the vicinity of a power line comprising the steps of:

providing an AC signal when the conductive member is in the presence of an electric field which is representative of the strength of the electric field,

averaging the peak of an AC signal when it occurs to provide an average peak signal,

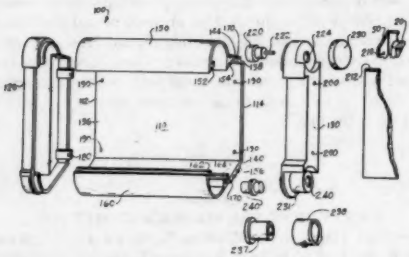
providing a reference signal derived from the average signal prior to a change in the member's attitude and/or altitude or while the apparatus is changing the member's attitude and/or altitude, and

moving the conductive member until either it arrives at a desired attitude and/or altitude for the conductive member or an average peak signal is provided which in cooperation with the reference signal indicates that the conductive member has entered an electric field whose strength is greater than a safe value.

4,683,465
DATA DISPLAY TERMINAL USING A FLAT DISPLAY PANEL

Ralph J. Lake, Jr., Somerville, N.J.; Timothy R. Stern, Southfield, Mich.; George A. Sudol, Mine Hill, and Vladimir Selepouchin, Cedar Grove, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1984, Ser. No. 683,579
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—700 **16 Claims**



1. A data display terminal comprising a generally thin, flat display panel assembly;

a base to which said dispaly panel assembly is pivotably coupled; and

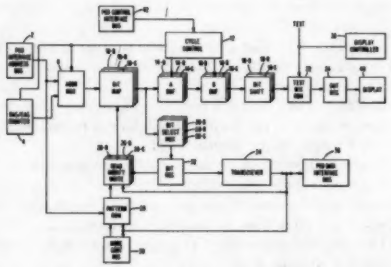
means for coupling together said display panel assembly and said base, said coupling means including a hollow tubular member connected to said display panel assembly, a torsion spring disposed within said hollow tubular member, a frictional sleeve enclosing said hollow tubular member, and a split tubular bracket enclosing said sleeve and said hollow tubular member, said split tubular bracket being connected to said base;

said display panel assembly including a central frame portion and left nd right end brackets secured thereto and flat display panel seated on said central frame portion.

4,683,466
MULTIPLE COLOR GENERATION ON A DISPLAY

Thomas O. Holtey, Newton, Mass.; Kenneth E. Bruce, Nashua, N.H., and Gary J. Goss, Acton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 14, 1984, Ser. No. 681,539
Int. Cl.[4] G09G *1/16, 1/28*
U.S. Cl. 340—703 **7 Claims**



1. A color display graphics system for displaying a color image, said color image being made up of a plurality of pixels, said system including apparatus for painting areas of said color image with a plurality of colors and a plurality of shades of colors, said apparatus comprising:

a plurality of bit map memory means for storing bits, combination of said bits in corresponding locations of said plurality of bit map memory means determining one of said plurality of colors of a corresponding one of said pixels;

read only memory means coupled to said plurality of bit map memory means for storing a plurality of bit patterns for each of said plurality of colors, a first of said plurality of bit patterns being representative of a plurality of solid colors and a second plurality of said plurality of bit patterns being representative of predetermined shades of said each of said plurality of colors;

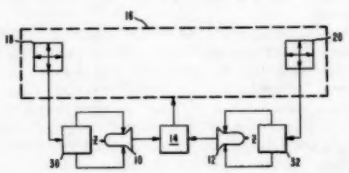
a plurality of bit select means coupled to said plurality of bit map memory means, each of said plurality of bit select means selecting a corresponding bit from each of said plurality of bit map memory means; and

a plurality of gate means coupled to said plurality of bit select means and to said read only memory means and responsive to plurality of bits from a selected one of said plurality of bit patterns and said corresponding bit from each of said plurality of bit memory means for performing a logical operation and to write the result representing color bit signals back in said corresponding locations of said plurality of bit map memory means for displaying said color image.

4,683,467
IMAGE REGISTRATION SYSTEM

Malcolm Macaulay, Fullerton, and William F. Singleton, Balboa Island, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 1, 1983, Ser. No. 556,882
Int. Cl.[4] G02B *27/02*
U.S. Cl. 340—705 **19 Claims**



10. An image registration system for registering a plurality of images projected onto a common screen, comprising:

a plurality of projection means for projecting the plurality of separate images onto the common screen, each image having a registration pattern disposed in a fixed orientation within the image, and each projection means having respective cathode ray tubes with beam centering/deflection coils;

a plurality of photodetector sensors, each of which is associated with a respective one of the plurality of projection means, each photodetector sensor comprising three photodetectors arranged in a right angle relationship with the photodetector at the vertex of the right angle being the reference photodetector, the other two photodetectors being directional photodetectors, each photodetector providing detection signals in response to the detection of registration pattern illumination;

the plurality of photodetector sensors collocated with the screen and having predetermined spatial relationships with each other such that when the registration patterns are in register with the associated sensors, then the images are in register with each other;

a plurality of processing means, each of which is associated with a respective one of the plurality of sensors, for providing two difference signals by comparing the detection signal from the reference photodetector to the detection signal of one of the two directional photodetectors, thereby providing one difference signal, and comparing

the detection signal of the reference photodetector to the detection signal of the other of the two directional photodetectors, thereby providing a second difference signal; and

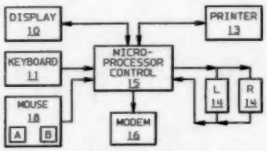
a plurality of repositioning means, each of which is associated with a respective one of the plurality of processing means, for controlling the current of the beam centering/deflection coils of the cathode ray tube in response to the difference signals, thereby positioning the image of the CRT.

4,683,468

METHOD FOR MANIPULATION OF GRAPHIC SUB-OBJECTS IN AN INTERACTIVE DRAW GRAPHIC SYSTEM

Carol S. Himelstein, and John S. Wang, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,762
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—709 **11 Claims**



1. A method for editing a sub-object of a graphic object displayed in an interactive draw graphic system in which said object has at least one vertex and a pair of selectable line segment sub-objects which define said vertex, said method including the steps of;

(a) assigning to said vertex an attribute which permits said vertex to 'break' during a sub-object editing action,

(b) selecting said line segment sub-object at a different point along the length of said line segment depending upon the modification desired on said sub-object, and

(c) moving said sub-object selected in step b) to obtain said desired modification.

4,683,469

DISPLAY TERMINAL HAVING MULTIPLE CHARACTER DISPLAY FORMATS

Jeff Elsmore, Tempe; Kenneth W. Stoorza, and Timothy A. Walker, both of Phoenix, all of Ariz., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 14, 1985, Ser. No. 711,912
Int. Cl.[4] G09G *1/06*
U.S. Cl. 340—723 **35 Claims**

1. An apparatus for displaying rows of characters, in a plurality of different display formats, said display formats being characterized by display frames that include different respective numbers of characters and different respective numbers of character rows, comprising:

(a) a CRT display;

(b) CRT control means for controlling the timing of the display, said control means including means for generating horizontal and vertical sync signals and means for storing a set of display parameters including at least:

(i) the number of character rows in each display frame,

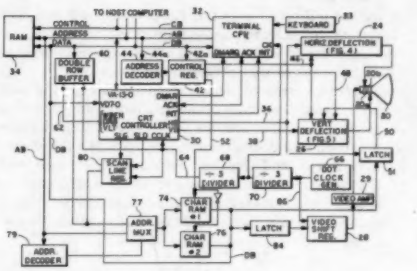
(ii) the number of characters in each character row, and

(iii) the number of horizontal scan lines in each character row;

(c) memory means for storing data indicative of the characters to be displayed within the display frame and for storing one set of said display parameters for each of said display formats;

(d) a digital computer connected to the memory means and the CRT control means for loading the CRT control means with a selected one of said sets of display parameters, and for generating a plurality of sets of display format control signals, each set of display parameters and display format control signals being associated with a respective one of said display formats;

(e) a horizontal deflection circuit responsive to the display format control signals and to the horizontal sync signal for driving the electron beam of the display at one of at least first and second horizontal rates;



(f) a vertical deflection circuit responsive to the display format control signals and to the vertical sync signal for driving the electron beam of the display at one of at least first and second vertical rates;

(g) format indicating means for specifying the display format to be used in displaying characters on said CRT display;

(h) dot clock generating means connected to the CRT display for generating a constant frequency dot clock signal for use in controlling said electron beam;

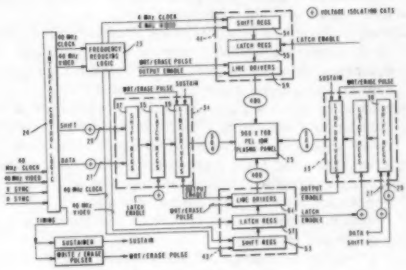
(i) wherein the display frames associated with different display formats have approximately constant dimensions.

4,683,470

VIDEO MODE PLASMA PANEL DISPLAY

Tony N. Criscimagna, Woodstock; Harry S. Hoffman, Jr., Saugerties, and William R. Knecht, Kingston, all of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Mar. 5, 1985, Ser. No. 708,328
Int. Cl.[4] G09G *3/28*
U.S. Cl. 340—771 **5 Claims**



1. In a plasma display device operated in video mode;

a plasma display video monitor having a plurality of display cells arranged in a matrix configuration; and

means for generating a visual representation of a data stream

of video signals during a sequence of horizontal scan line operations, said means including,

addressing means for updating said panel on a scan line basis,

said addressing means generating a write sequence applied to a first scan line whereby all display cells in said scan line are written,

said write sequence comprising a full write signal applied in coincidence with a sustain signal during the normal sustain alternation,

said addressing means generating a selective erase sequence to selectively erase the cells in said first scan line in accordance with the contents of said data stream,

said selective erase sequence comprising an erase signal positioned near the leading edge of a sustain signal alteration, and

a second full select scan line for priming said first scan line during said selective erase sequences,

the duration of said write and erase sequences defining the update time of said plasma display device,

said full line write sequence applied to all cells in said first and second scan lines combined with said selective erase sequence in said first scan line eliminating the conventional plasma display non-select state of said plasma display device and the time associated therewith whereby the combined time for sustain, write, and selective erase sequences is substantially reduced to correspond to the data rate of said data stream of video signals.

4,683,471

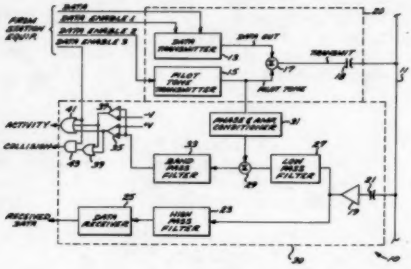
DATA BUS PILOT TONE

Gary W. Blackstone, Mission Viejo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 30, 1985, Ser. No. 696,662

Int. Cl.[4] H04Q *3/00*; H04J *1/02*; H04N *3/02*

U.S. Cl. 340—825.5 **6 Claims**



1. A transceiver for a local area network system having a communications medium comprising:

a. transmitter means for providing a communications signal for transmission on the communications medium, said communications signal including a transmit data component and a transmit reference component;

b. means for receiving signals on the communications medium and for separating a received signal into a received data component and a received reference component; and

c. comparison and logic means responsive to said transmit reference component and to said received reference component for providing an output indicative of whether a transmission collision has occurred, said comparison and logic means including:

i. means for comparing said transmit reference component with said received reference component and for providing an output indicative of whether said received reference component is based on said transmit reference component, said comparing means including:

(a) conditioning means responsive to said transmit reference component for providing a conditioned reference signal adapted to be substantially similar to a received reference component which is based on said transmit reference component, and

(b) means for subtracting said conditioned reference signal from said received reference component to provide said comparing means output; and

ii. logic means responsive to the output of said comparing means for providing said output indicative of whether a transmission collision has occurred.

4,683,472

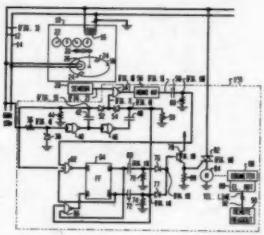
SIGNAL READING SYSTEM SUCH AS FOR REMOTE READING OF METERS

Thomas E. Beling, Saxonville, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Filed Aug. 5, 1982, Ser. No. 405,689

Int. Cl.[4] G08C *13/00*

U.S. Cl. 340—870.02 **19 Claims**



1. A system for detection and readout of energy flow in a power line carrying an alternating voltage and current, comprising:

a watt-hour meter including a sensor for sensing energy in the line and a rotating member with a portion passing a predetermined position during rotation,

sensing means for sensing the portion and producing signals having signal lengths.

a mechanical register for accumulating mechanical motions applied thereto and indicating a value representative of the accumulated motions,

amplifier means for responding to the signals and converting the signals to mechanical motions,

said amplifier means being coupled to said sensing means so that said amplifier means is arranged to convert the signal sensed by said sensing means to mechanical motions, and coupled to said mechanical register for supplying said mechanical motions to the register so as to cause said register to accumulate the motions of said amplifier means and indicate a value representative of the signals, said amplifier means including:

pulse forming means responsive to said sensing means for producing pulses, and

converter means responsive to pulses time displaced from each other by a time greater than the signal lengths,

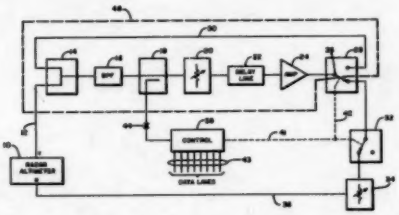
said converter means being coupled to the pulse forming means to receive the pulses,

said amplifier means including coupling means for coupling said amplifier means to the line, said pulse forming means being connected to said coupling means for producing the pulses from the power in the line in synchronism with a component of power in the line.

4,683,473
RADAR TRANSIT TIME SIMULATOR DEVICE

James R. Haugland, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 10, 1986, Ser. No. 817,642
Int. Cl.[4] G01S 7/40
U.S. Cl. 342—172 11 Claims



1. Apparatus for simulating the transit time of a radar signal, the radar being of the type having transmitter output means for periodically generating and transmitting a burst of rf energy and receiver input means for later receiving a return of rf energy from a target, comprising:

(a) recirculating delay line means including a fixed delay element, two terminal input means coupled to the input of said fixed delay element and a single-pole, double-throw electronic switching means having said single pole coupled to the output of said fixed delay element;

(b) means coupling one terminal of said single-pole, double-throw electronic switching means to a first terminal of said two terminal input means;

(c) means for coupling the other terminal of said single-pole, double-throw electronic switching means to said receiver input means;

(d) means for coupling the transmitter output of said radar altimeter to the second terminal of said two terminal input means; and

(e) electronic control means operatively coupled to said single-pole, double-throw electronic switching means for allowing said rf pulse to recirculate through said fixed delay element a predetermined number of times before being routed to the receiver input of said radar equipment wherein said electronic control means comprises counting means, means for coupling said counting means to said recirculating delay line means for counting the number of traversals of said rf pulse through said recirculating delay line means, means for detecting when a count reaches a predetermined value, and means responsive to said detecting means for altering the state of said single-pole, double-throw and single-pole, single-throw electronic switching means.

4,683,474
SURVIVABLE GROUND BASE SENSOR

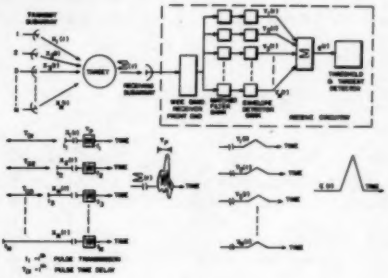
George W. Randig, Harvard, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1985, Ser. No. 705,827
Int. Cl.[4] H01Q 3/22. 1/04
U.S. Cl. 342—368 9 Claims

1. A survivable ground base sensor apparatus comprising in combination:

a plurality of radiating elements encased in a first hardened enclosure means, each of said plurality of radiating elements cooperating to form a steerable subarray means, a predetermined number of said subarray means are arranged in a predetermined geometric configuration to form a phased-array radar system, each subarray means being spaced at least ten nautical miles from each other, said first hardened enclosure means being located above ground, and

a plurality of electronics means each encased in a second hardened enclosure means, said plurality of second hardened enclosure means being located below ground, each of said plurality of electronic means operatively connected to its corresponding subarray means, each subarray means transmits a single pulse at a different frequency in time sequence that adds coherently to form a beam with a predetermined azimuth and range, the time of transmission is adjusted so that all of the n pulses arrive at a target

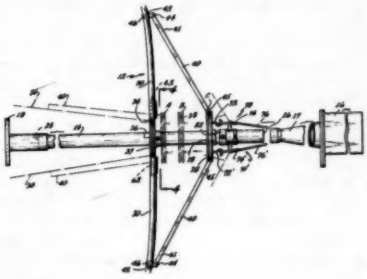


in time coincidence, when a target is at this range and azimuth, n time coincident pulses are reflected back to each subarray means, each subarray means utilizing a receiver that contains n separate channels tuned to the n frequencies that are transmitted by each of said subarrays means, n is defined as a positive integer greater than one, each of said subarray means comprises a self-contained, small phased array radar means, said electronic means receiving other signal returns and performing non-coherently time-delay processing of all the target return signals to perform target detection.

4,683,475
FOLDING DISH REFLECTOR

Robert A. Luly, 449 S. Sierra Way, San Bernardino, Calif. 92406

Continuation of Ser. No. 279,734, Jul. 2, 1981, Pat. No. 4,527,166, which is a continuation-in-part of Ser. No. 247,922, Mar. 26, 1981, Pat. No. 4,608,571. This application Sep. 4, 1985, Ser. No. 750,847
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.[4] H01Q 15/20
U.S. Cl. 343—915 4 Claims



1. A foldable reflector comprising:

a central support:

a plurality of resiliently flexible normally straight radial spokes of tapering cross section, the cross-sectional taper

of each spoke being such that said spoke is stressable to a desired reflector curvature, said spokes being mounted at their thicker ends to said central support for pivotal movement between an axial folded position and a radial deployed position;

means for simultaneously urging each of said radial spokes to said radially deployed position:

means for stressing said radial spokes to said desired reflector curvature in said deployed position, said spokes reverting to said normal straight state in said folded position; and

elastic sheet means of reflecting material deployable by said spokes such that said sheet means conform to the curvature of said stressed spokes to define a dished reflecting surface.

4,683,476

DRAWING MACHINE HAVING AUTOMATICALLY REPLACED WRITING MEMBERS AND APPARATUS THEREFOR

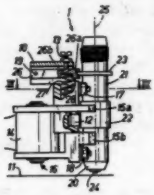
Alphonse Ferrari, Vincennes; Michel Roche, Courtry, and Jean-Claude Dard, Villemomble, all of France, assignors to Benson S.A., Creteil, France

Filed Jun. 13, 1985, Ser. No. 744,353

Claims priority, application France, Jun. 22, 1984, 84 09829; Oct. 29, 1984, 84 16500

Int. Cl.[4] G01D *9/00, 9/28, 15/16*

U.S. Cl. 346—29 **27 Claims**



1. A marking head for a plotting machine, comprising:

a support;

a writing member having side walls and a marking tip at one end thereof,

means for mounting said writing member for longitudinal movement on said support between a work position wherein the writing tip is operative for producing a mark on a writing medium placed opposite said support and a rest position further away from the writing medium, including;

means on said support for engaging the side wall of said writing member when the same is urged toward said support, in a direction transverse to said longitudinal direction while allowing movement of said writing member relative to the support between said work and said rest positions; and

holding means on said support and said writing member for producing a magnetic force for urging said side wall toward said support in said transverse direction and sufficient for holding said writing member at least in said rest position,

said mounting means arranged to allow said writing member to be pulled away from said support in a direction generally opposite to said transverse direction in at least one position, and

selectively controlled driving means for moving said writing member in the longitudinal direction from said rest to said work positions thereof.

4,683,477

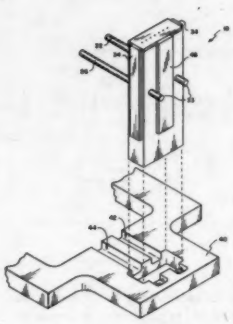
INK JET PRINT HEAD

Hilarion Braun, Xenia, and Fletcher Bray, Fairfield, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1986, Ser. No. 901,669

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 **5 Claims**



1. An ink jet print head of the type having an elongated rectangular print head body defining an ink reservoir having an opening at one end of said elongated body, an orifice plate having a plurality of orifices fixed over said opening in said ink reservoir, for expelling ink from said orifices to form a plurality of ink jets, means for supplying ink under pressure to said reservoir, piezoelectric transducer means mounted on the exterior of said elongated body and extending in a longitudinal direction, for inducing longitudinal vibrations in said body to stimulate said ink jets, and mounting means for mechanically supporting said ink jet print head, said mounting means contacting said print head body at a nodal plane intermediate the ends of said print head body, characterized by: said means for supplying ink comprising rigid tube means connected to said print head body at said nodal plane and said mounting means comprising means for supporting said print head body by said rigid tube means.

4,683,478

PRINTER WITH DETACHABLY MOUNTABLE INK RIBBON CASSETTE

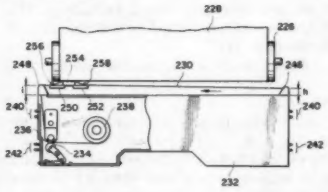
Masayuki Suzaki, Fujisawa; Shoji Nishiwaki, Machida; Toshitaka Hayashima, Yamato; Kazuo Uezu, Hadano; Hidejirou Maehara, Yokohama, and Masanori Momose, Hiratsuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 631,603, Jul. 17, 1984. This application Nov. 29, 1985, Ser. No. 803,503

Claims priority, application Japan, Jul. 23, 1983, 58-134861; Jul. 23, 1983, 58-134862; Jul. 29, 1983, 58-138942; Oct. 19, 1983, 58-195496

Int. Cl.[4] G01J *15/10*

U.S. Cl. 346—76 PH **23 Claims**



1. A printing system comprising:

a platen for placing thereon a recording medium;

supporting means for supporting a part of a printing ribbon

extending between a pair of first and second positions which are fixed with respect to said platen, such that said part of the ribbon is inclined with respect to said platen and said part of printing ribbon between said pair of first and second positions is gradually separated farther away from said platen in a first direction; and

a carriage supported to be movable along said platen in a reciprocating manner, said carriage having mounted thereon a printing divice which effects printing on said recording medium using said printing ribbon while said carriage moves in said first direction and which does not effect printing while said carriage moves in a second direction which is opposite to said first direction.

4,683,479

THERMAL PRINTER

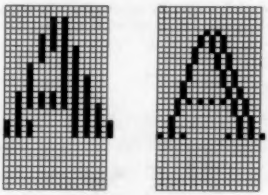
Keiichi Horiya, Numazu; Kazuhide Takahama, Shizuoka, and Yutaka Usami, Mishima, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,074

Claims priority, application Japan, Mar. 12, 1985, 60-48641

Int. Cl.[4] G01D *15/10;* **B41J** *3/10*

U.S. Cl. 346—76 PH **6 Claims**



1. A thermal printer comprising:

a thermal head having a plurality of heating elements arranged at a preset pitch D1 in a line;

memory means including a first memory area in which a plurality of high speed printing character data each column of which is composed of n-bit data are stored and a second memory area in which a plurality of high resolution printing character data each column of which is composed of m-bit data (m>n) are stored; and

printing control means for reading out the m-bit data of each column designated by an input character code data from said second memory area in accordance with a high resolution printing mode designation data, for selectively energizing the heating elements of said thermal head to execute a high resolution printing in accordance with said m-bit data read out, and also for reading out the n-bit data of each column designated by an input character code data from said first memory area in accordance with a high speed printing mode designation data, for converting said n-bit data into N-bit data (N>n) corresponding to the n-bit data, for selectively energizing the heating elements of said thermal head to execute a high speed printing at an average pitch D2 (D2 is larger than D1 and different from the integer multiple of D1) between adjacent dots in accordance with said N-bit data.

4,683,480

X-Y PLOTTER DRIVE ROLLER ARRANGEMENT

Masami Sakamoto; Ryoichi Nagumo, and Tamio Ishihara, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,854

Claims priority, application Japan, Jul. 6, 1984, 59-139058

Int. Cl.[4] G01D *15/16;* **B65H** *17/38;* **B41J** *11/00*

U.S. Cl. 346—134 **7 Claims**

1. An X-Y plotter comprising:

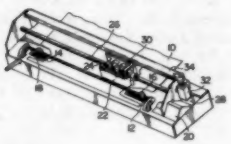
a recording paper;

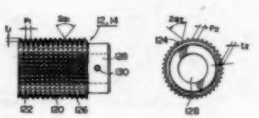
at least one recording element for recording on said recording paper;

first drive means for moving said recording element in a direction X;

at least one set of a drive roller means and a pinch roller means disposed for clamping said recording paper therebetween; and

second drive means for rotating said drive roller means to said recording paper in a direction Y which is orthogonal to the moving direction of said recording element;





said rive roller means having a plurality of projections for engaging and piercing said recording paper to insure exact feeding of said recording paper without slippage thereof, said plurality of projections being formed by a plurality of V-grooves cut in an outer surface of said drive roller means both in the axial direction of said drive roller means and in the circumferential direction substantially orthogonal to said axial direction, each of said projections having the shape of a substantially quadrangular pyramid with a sharp point for enabling piercing of the recording paper.

4,683,481

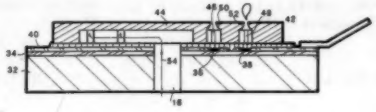
THERMAL INK JET COMMON-SLOTTED INK FEED PRINTHEAD

Samuel A. Johnson, Eagle, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 806,294, Dec. 6, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 939,285

Int. Cl.[4] G01D *15/18;* **H05B** *3/00*

U.S. Cl. 346—140 R **6 Claims**



1. A thermal ink jet print head assembly including:

(a) a substrate member having an elongated slot therein for receiving ink from a common reservoir, said substrate mounted on a header for providing a supply of ink and further having an ink feed slot which is aligned with said elongated slot on said substrate for providing ink flow to said elongated slot,

(b) a plurality of resistive heater elements spaced around the periphery of said slot at predetermined distances therefrom and connected to a corresponding plurality of conductors atop the surface of said substrate member, and

(c) a barrier layer and orifice plate member mounted atop said conductors and including a corresponding plurality of ink jet reservoirs for receiving ink from said elongated

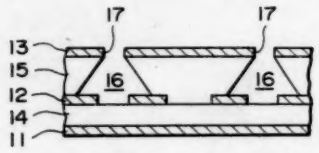
slot, said reservoirs aligned with said resistive heater elements and with a plurality of exit orifices for receiving thermal energy from said heater elements and ejecting ink onto a selected print medium, said reservoirs all being at predetermined ink flow path distances from said elongated slot, whereby the liquid pressure flow loss between said reservoirs and said slot is equalized.

4,683,482

ION GENERATING DEVICE AND METHOD OF MANUFACTURING SAME

Yutaka Inaba, Kawasaki, and Yujiro Ando, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 711,178, Mar. 13, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 930,047
Claims priority, application Japan, Mar. 19, 1984, 59-51035
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—159 **6 Claims**



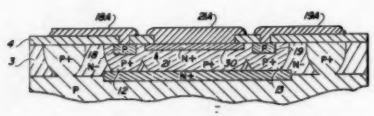
1. An ion generating device, comprising:
a plurality of first electrodes extending in a first direction;
a plurality of second electrodes extending in a second direction which is different from the first direction, to constitute a matrix;
a third electrode so disposed that said second electrodes lie between said first electrodes and the third electrode, said third electrode having apertures corresponding to the matrix;
a first dielectric member disposed between said first electrodes and said second electrodes; and
a second dielectric member disposed between said second electrodes and third electrode, said second dielectric member having a plurality of apertures corresponding to the matrix, which apertures each have a cross-sectional area generally decreasing toward said third electrode.

4,683,483

SUBSURFACE ZENER DIODE AND METHOD OF MAKING

Stephen R. Burnham, and William J. Lillis, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed May 5, 1986, Ser. No. 859,454
Int. Cl.[4] H01L *29/90*
U.S. Cl. 357—13 **8 Claims**



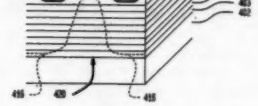
1. A subsurface zener diode including:
(a) a P type substrate;
(b) a lightly doped N type region on the P type substrate;
(c) means for electrically isolating the N type region from any other lighly doped N type region on the P type substrate;
(d) a heavily doped first P type region disposed in the lightly doped N type region and having a relatively heavily doped inner portion and a relatively lightly doped laterally outdiffused peripheral portion;
(e) a second P type region disposed in the lightly doped N type region and having a lightly doped peripheral portion, at least a part of which overlaps a portion of the lightly doped laterally outdiffused peripheral portion of the first P type region;
(f) a heavily doped N type region disposed partly in the first P type region and having a peripheral portion including a first peripheral portion, the first peripheral portion being centrally located entirely in the lightly doped laterally outdiffused peripheral portion of the first P type region and the lighlty doped peripheral portion of the second P type region,
wherey no peripheral portion of the heavily doped N^+ region is disposed in P type semiconductor material that is more heavily doped than P type semiconductor material adjacent to a subsurface portion of the PN junction between the heavily doped N^+ region and the first P type region.

4,683,484

LATERAL CONFINEMENT OF CHARGE CARRIERS IN A MULTIPLE QUANTUM WELL STRUCTURE

Gustav E. Derkits, Jr., Boro of New Providence, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 23, 1985, Ser. No. 768,673
Int. Cl.[4] H01L *29/48, 29/205, 29/78, 29/06*
U.S. Cl. 357—16 **9 Claims**



1. A semiconductor device comprising
a semiconductor body of first conductivity type having at least one relatively narrow bandgap layer and two relatively wide bandgap layers, said relatively narrow bandgap layer being sandwiched between and contiguous with said relatively wide bandgap layers and defining a quantum well; and
a ring-like zone of a second conductivity type formed within said semiconductor body and spaced apart from said narrow bandgap layer for generating an electric field barrier within said narrow bandgap layer, said electric field barrier defining a region of said narrow bandgap layer in which charge carriers are laterally confined.

4,683,485

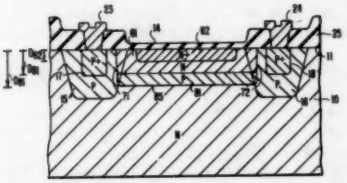
TECHNIQUE FOR INCREASING GATE-DRAIN BREAKDOWN VOLTAGE OF ION-IMPLANTED JFET

Gregory A. Schrantz, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 27, 1985, Ser. No. 813,718
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **6 Claims**

1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a first semiconductor region of a second conductibity type, opposite said first conductivity type, formed in a first surface portion of said substrate;
a second semiconductor region of said second conductivity type, formed in a second surface portion of said substrate, spaced apart from said first surface portion by a third surface portion therebetween; and
a third semiconductior region of said first conductivity type

formed in said third surface portion of said substrate and being contiguous with said first and second regions so as to define therewith respective first and second PN junctions, and wherein a first portion of said third semiconductor region is spaced apart from said first and second PN junctions by a second portion of said third semiconductior region contiguous with and extending a separation distance away from said first and second PN junctions to said first portion of said third semiconductor region, said first portion of said third semiconductor region having a first impurity concentration, and wherein said second portion of said third semiconductor region has a second



impurity concentration less than said first impurity concentration and the profile of which second impurity concentration of said second portion of said third surface portion of said substrate in which said third semiconductor region is formed is effectively constant across said separation distance between said first and second PN junctions and said first portion of said third semiconductor region; and

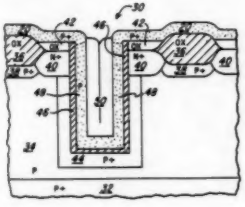
a fourth semiconductor region of said second conductivity type disposed in said substrate beneath the third surface portion thereof so as to be contiguous with each of said first, second ahd third semiconductor regions and defining a third PN junction with third semiconductor region.

4,683,486

DRAM CELL AND ARRAY

Pallab K. Chatterjee, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1984, Ser. No. 654,285
Int. Cl.[4] H01L *29/78, 29/04, 29/06, 27/02*
U.S. Cl. 357—23.6 **11 Claims**



1. A device comprising:

a substrate having a trench;

an insulating layer formed on the walls of said trench;

a semiconductive layer formed on said insulating layer, said semiconductive layer having a transistor formed in said trench, said transistor having a source, a drain and a channel, said drain serving as a node for storing charge; and

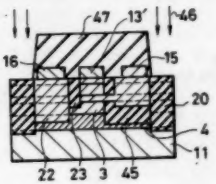
a gate formed in said substrate adjacent to said insulating layer, said gate controlling current in said channel.

4,683,487

HETEROJUNCTION BIPOLAR TRANSISTOR

Kiichi Ueyanagi, Kokubunji; Susumu Takahashi, Nishitama; Toshiyuki Usagawa, Kokubunji; Yasunari Umemoto, Hachioji, and Toshihisa Tsukada, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,465
Claims priority, application Japan, Nov. 9, 1984, 59-234908
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 **19 Claims**



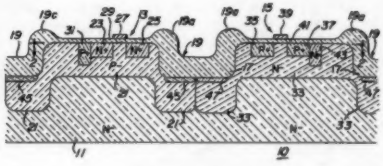
1. A heterojunction bipolar transistor having a main surface and comprising active regions which include at least one heterojunction, the active regions having top and bottom surfaces extending in the same direction as the main surface and side surfaces extending between the top and bottom surfaces, a base region lead-out portion which is formed spaced from a side surface of said active regions and extending to said main surface, with an insulating region filling the space between the side surface of the active regions and the base region lead-out portion, and a collector region lead-out portion which is formed spaced from another side surface of said active regions and extending to said main surface, with another insulating region filling the space between said another side surface of the active regions and the collector region lead-out portion, wherein the insulating region and the another insulating region are regions in self-alignment with an emitter electrode on the main surface of the bipolar transistor.

4,683,488

LATCH-UP RESISTANT CMOS STRUCTURE FOR VLSI INCLUDING RETROGRADED WELLS

William W. Y. Lee, Fullerton, and Kuang-Yeh Chang, Fountain Valley, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 594,589, Mar. 29, 1984, abandoned.
This application Feb. 28, 1986, Ser. No. 835,447
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 **7 Claims**



1. A complementary metal oxide semiconductor (CMOS) structure comprising:

a semiconductor substrate;

a trench region formed in said substrate;

a first retrograde well region of a first conductivity type formed in said substrate and having (a) an upper portion adjacent said trench region and (b) a lower portion beneath said trench region, said upper and lower portions merging together and having substantially the same depth;

a second retrograde well region of a second conductivity

type formed in said substrate and having (a) an upper portion adjacent said trench region and (b) a lower portion beneath said trench region, said upper and lower portions merging together and having substantially the same depth, said upper portions of said first and second retrograde well regions being separated by said trench region and said lower portions of said first and second retrograde well regions being adjacent one another;

first and second metal oxide semiconductor (MOS) devices respectively formed in said first and second retrograde well regions; and

first and second heavily doped field regions respectively formed in said first and second retrograde well regions beneath and contiguous to said trench region, said first and second heavily doped regions being separated from said first and second MOS devices.

4,683,489

COMMON HOUSING FOR TWO SEMI-CONDUCTOR BODIES

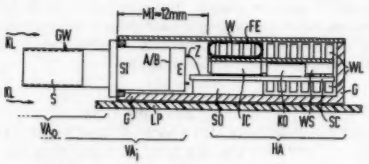
Michael Langenwalter, Stockdorf/Gauting; Karl H. Moehrmann, Munich; Herbert Prussas, Reichertshausen, and Lothar Spaeter, Annweiler am Trifels, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,514

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1984, 3429234

Int. Cl.[4] **H01L** *23/02;* **F28F** *7/00;* **H01B** *7/34;* **H02B** *1/00*

U.S. Cl. 357—81 **7 Claims**



1. A common housing for two semi-conductor bodies having a front and back section for two spatially separated semi-conductor bodies attached in the housing interior which are connected electrically conductive to one another, whereby housing surfaces are cooled during operation by a flowable coolant, comprising:

the front, first semi-conductor body being attached in the front section thereof and the back, second semi-conductor body being attached in the back section thereof;

the maximum operating temperature of said back semi-conductor body being higher than the maximum operating temperature of the front semi-conductor body;

the thermal resistance between the front semi-conductor body and a front cooling surface of the housing surface at the front section connected thermally-conductive to it, as well as the thermal resistance between the back semi-conductor body and a back cooling surface of the housing surface at the back section connected thermally-conductive to it, and differing from the front cooling surface, are both lower than both the thermal resistance in the housing interior between the two semi-conductor bodies as well as the thermal resistance between the front and the back cooling surfaces; and

said front cooling surface being upstream of said back cooling surface in a flow path of said coolant.

4,683,490

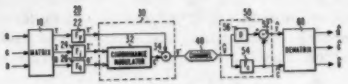
VIDEO SIGNAL PROCESSING APPARATUS

Christopher H. Strolle, Glenside, Pa.; Terrence R. Smith, Westmont, N.J., and Brian M. Hadwen, East Hampstead, N.H., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 5, 1985, Ser. No. 741,591

Int. Cl.[4] **H04N** *9/67*

U.S. Cl. 358—30 **29 Claims**



1. Video signal processing apparatus, comprising:

respective input terminals for applying a luminance signal and a color difference signal representative of a scene;

first filter means having an input coupled to said color difference signal input terminal, and having an output, for generating a filtered color difference signal occupying a first region of a predetermined spatio-temporal frequency space;

second filter means having an input coupled to said luminance signal input terminal, and having an output, for generating a filtered luminance signal occupying a second region of said predetermined spatio-temporal frequency space exclusive of said first region; and

utilization means, including an encoder having first and second inputs coupled to the outputs of said first and second filter means respectively, for encoding said filtered luminance and color difference signals; wherein

said filtered luminance and color difference signals are encoded to occupy mutually exclusive spatio-temporal frequency spaces to form a composite video signal.

4,683,491

DISPLAY SYSTEM COMPRISING A PLURALITY OF DISPLAY CELLS ARRANGED IN AN X-Y MATRIX AND A PLURALITY OF HORIZONTAL-EXTENDING BLINDS DISPOSED ADJACENT THE UPPER EDGES OF THE DISPLAY CELLS IN THE ROWS OF THE MATRIX

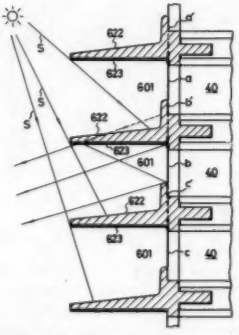
Satoshi Shimada; Nobuo Kitamura, both of Kanagawa; Kunio Shikakura, and Namio Maeda, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,806

Claims priority, application Japan, Apr. 24, 1984, 59-82257; Nov. 20, 1984, 59-244877

Int. Cl.[4] **H04N** *9/12, 3/12, 5/66;* **G09G** *3/20*

U.S. Cl. 358—56 **6 Claims**



1. A display system comprising:

a plurality of display cells arranged in a vertically-disposed

X-Y matrix to form a display device, each of said display cells representing a single picture element and being provided with a horizontally-extending blind adjacent its upper edge, said horizontally-extending blind having a black top surface and a reflecting bottom surface;

a signal source for supplying a standard video signal; and

driving means for supplying said standard video signal to said display cells such that a picture is reproduced on said display device.

4,683,492

METHOD AND APPARATUS FOR RECORDING A FULL-COLOR IMAGE WITH A PLURALITY OF COLORANTS ON THE BASIS OF A SET OF AREA FACTORS FOR THE COLORANTS SELECTED FROM A PLURALITY OF SETS OF AREA FACTORS CALCULATED FROM A PLURALITY OF SETS OF EQUATIONS

Susumu Sugiura, Yamato, and Yasuo Kohzato, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,188

Claims priority, application Japan, Mar. 8, 1983, 58-37717; Mar. 8, 1983, 58-37718; Nov. 18, 1983, 58-218297; Nov. 18, 1983, 58-218299

Int. Cl.⁴ G03F *3/08*; H04N *1/46*

U.S. Cl. 358—80 **14 Claims**

1. A method for recording a full-color image comprising a plurality of pixels, the method comprising the steps of:

detecting levels of three additive primary colors of red, green and blue for each pixel of the image;

calculating an area factor for each of three subtractive primary colors of yellow, magenta and cyan in response to the levels of the three additive primary colors; and

forming output pixels in response to the area factors obtained in said calculating step;

wherein in said calculating step a plurality of sets of area factors are calculated from a plurality of sets of equations corresponding to a plurality of sets of magnitude relationships between area factors, and one set of area factors having the same magnitude relationships as the set of magnitude relationships corresponding to the set of equations from which said one set of area factors was calculated is selected.

4. A method for recording a full-color image comprising a plurality of pixels, the method comprising the steps of:

detecting levels of three additive primary colors of red, green and blue for each pixel of the image;

calculating in response to the levels of the three additive primary colors area factors for three colors, consisting of black and two of the three subtractive primary colors of yellow, magenta and cyan; and

forming output pixels in response to the area factors obtained in said calculating step

wherein in said calculating step a plurality of sets of area factors are calculated from a plurality of sets of equations corresponding to a plurality of sets of magnitude relationships between area factors, and one set of area factors having the same magnitude relationships as the set of magnitude relationships corresponding to the set of equations from which said one set of area factors was calculated is selected.

4,683,493

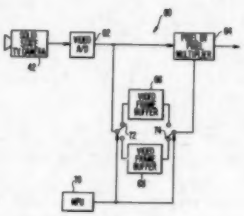
COMPACT OPTICAL APPARATUS FOR TRACKING A PATH OF MOVEMENT OF A TOOL ALONG A LINE OF TRAVEL ON A WORKPIECE

Jeffrey D. Taft, and James O. Seymour, Jr., both of Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1986, Ser. No. 876,520

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—101 **23 Claims**



21. A filter for filtering an image signal produced by a solid-state television camera to remove transient portions of an image corresponding to the image signal, comprising:

an analog-to-digital converter, coupled to the solid-state television camera, for receiving the image signal from said camera and for generating a digital image signal;

a multiplier circuit connected to said analog-to-digital converter;

first and second buffer circuits, each having an input and an output; and

switching means, connected to said analog-to-digital converter, said multiplier circuit and the inputs and outputs of said first and second buffer circuits, for selectively connecting the input of one of said first and second buffer circuits to said analog-to-digital converter to receive the digital image signal representing a current video frame, while simultaneously connecting the output of the other of said first and second buffer circuits to said multiplier circuit to provide a stored digital image signal representing a previous video frame to said multiplier circuit, so that said multiplier circuit multiplies the digital image signal representing the current video frame by the stored digital image signal representing the previous video frame, said multiplier circuit providing a filtered digital image signal as an output.

4,683,494

INTER-FRAME PREDICTIVE CODING APPARATUS FOR VIDEO SIGNAL

Akihiro Furukawa, and Junichi Ohki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Aug. 13, 1985, Ser. No. 765,357

Claims priority, application Japan, Aug. 13, 1984, 59-169011; Dec. 24, 1984, 59-272434; Dec. 28, 1984, 59-277488; Jan. 29, 1985, 60-14744; Jan. 29, 1985, 60-14745

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—136 **10 Claims**

1. An inter-frame coding apparatus for an input video signal having a quantizer, which comprises:

an input terminal for receiving said input video signal;

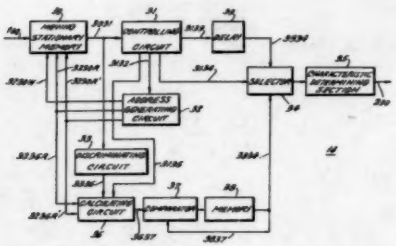
means coupled to said input terminal for processing said input video signal to determine whether respective picture elements are of a moving video content or a stationary video content and to produce a moving-stationary information signal;

means for storing said moving-stationary information signal of at least one frame period;

means coupled to said input terminal for delaying said input

video signal to supply a delayed input video signal for said quantizer; and

means coupled to said storing means for determining a quantization characteristic in response to said moving-station-



ary information signal stored in said storing means to produce a quantization control signal; said quantization control signal being applied to said quantizer to control said quantizer.

4,683,495

CIRCUIT ARRANGEMENT FOR DISTINGUISHING BETWEEN THE TWO FIELDS IN A TELEVISION SIGNAL

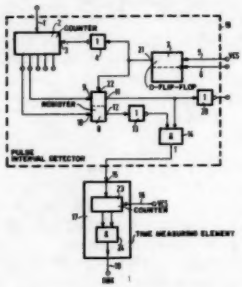
Thorsten Brock, Buchholz, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1985, Ser. No. 800,890

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443925

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—148 **8 Claims**



1. A circuit arrangement for distinguishing between two fields in a television signal, comprising a detector adapted to assume a first or a second signal state in dependence on the time position of synchronizing pulses contained in the television signal, and a time measuring element connected to the detector for producing a field identification signal in dependence on the duration of one of the signal states, characterized in that the detector is formed as a pulse interval detector for measuring the intervals between the trailing edge of each of said synchronizing pulses and the leading edge of subsequent synchronizing pulses, said detector assuming its first signal state, for pulse intervals located between first and second limit values and its second signal state for pulse intervals located outside these limits values.

4,683,496

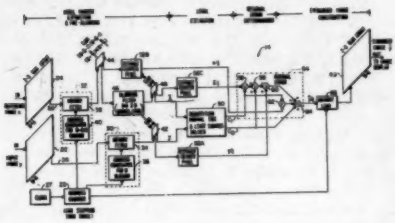
SYSTEM FOR AND METHOD OF ENHANCING IMAGES USING MULTIBAND INFORMATION

Victor T. Tom, Bedford, Mass., assignor to The Analytic Sciences Corporation, Reading, Mass.

Filed Aug. 23, 1985, Ser. No. 768,957

Int. Cl.[4] H04N *5/14*; G06K *9/40*

U.S. Cl. 358—166 **19 Claims**



1. A system for enhancing a first pictorial representation of am image within a first frequency band so as to provide an enhanced pictorial representation of said image using information contained within at least a second pictorial representation of said image within a second frequency band, wherein said second pictorial representation of said image has a better resolution than said first pictorial representation of said image, said system comprising:

means for generating a first plurality of signals as a function of a first set of pictorial segments of said first pictorial representation, wherein each of said first pictorial segments comprises at least one component part;

means for generating a second plurality of signals as a function of a second set of pictorial segments of said second pictorial representation, said second set of pictorial segments spatially corresponding with respect to said image to said first set of pictorial segments;

means, responsive to said first and second plurality of signals, for generating a third plurality of signals as a function of respective correlation information associated with and between each of said pictorial segments of said first set of pictorial segments and the corresponding pictorial segment of said second set of pictorial segments;

means, responsive to said first and third plurality of signals, for generating a fourth plurality of signals as a function of a pictorial component part of each pictorial segment of a third set of pictorial segments representative of said enhanced pictorial representation, wherein the pictorial segments of said third set spatially correspond with respect to said image to the pictorial segments of said first set, and each of said pictorial component parts of each of said pictorial segments of said first pictorial representation is modified as a function of the respective correlation information associated with that pictorial segment so as to provide each corresponding pictorial component part of said enhanced pictorial representation; and

means for combining said fourth plurality of signals so as to produce said enhanced pictorial representation.

4,683,497

TELEVISION RECEIVER FOR FLICKER-FREE REPRODUCTION OF AN INTERLACED VIDEO SIGNAL

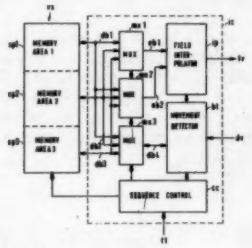
Soenke Mehrgardt, March-Neuershausen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,518

Claims priority, application European Pat. Off., Nov. 8, 1984, 84113457.0

Int. Cl.[4] H04N *5/208*

U.S. Cl. 358—166 3 Claims



1. A television receiver whereby an interlaced video signal containing fields is reproduced flicker-free, said receiver comprising:

a digital movement detector receiving digital video signals;

a digital field interpolator having an output which provides said digital flicker-free video signal;

a single frame memory which is divided into first, second and third memory areas;

first, second and third bidirectional data buses each respectively associated with said first, second and third memory areas and used for word-section/word-block transfer in a unidirectional mode;

first, second and third multiplexers each connected to all of said first, second and third memory areas by said first, second and third bidirectional data buses, respectively;

a first unidirectional data bus coupling the output of said first multiplexer to a first input of said field interpolator;

a second unidirectional data bus coupling the output of said second multiplexer to a second input of said field interpolator;

a fourth bidirectional data bus coupling said third multiplexer to said movement detector and used for word-section/word-block transfer in a undirectional mode;

a sequence control circuit for controlling said movement detector, said first, second and third multiplexers, said field interpolator and said memory; said sequence control circuit controlling the storing of data words into said first, second and third memory areas at a horizontal frequency rate and controlling the reading of stored data words from said first, second and third memory areas at twice the horizontal frequency rate;

said sequence control circuit operating such that the first and second word blocks of an nth line, the first and second word blocks of line n+1, and the first and second word blocks of line n+2 are written in direct succession into said first, second, third, first, second and third memory areas respectively where n=1, 4, N/2 and N=the number of frame lines or the number of frame lines only containing picture information;

said sequence control circuit further operating such that each data word of a line of a second field is divided into two sections and the first word section of an mth line, the second word section of said mth line, the first and second word sections of line m+1, the first and second word sections of line m+2 are written in direct succession into said second, third, first, second, third and first memory areas, respectively;

said sequence control circuit further operating such that during the second half of the duration of a triple sequence of successive lines, data words of the respective triple sequence which are delayed by one frame period are read from said frame memory and compared with the data words of the triple sequence in said movement detector, and that during the first half of the duration of the next triple sequence, said data words, together with movement information are written into those of said first, second and third memory areas which contain the data word delayed by one frame period, and wherein said first and second word blocks of each data word are read out together with the corresponding word sections of each data word of the respective triple sequence.

4,683,498

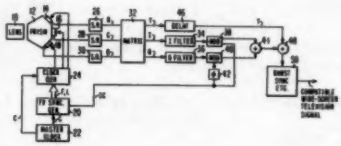
COMPATIBLE WIDE-SCREEN TELEVISION SYSTEM CAMERA

Robert J. Topper, Hatboro, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1986, Ser. No. 853,855

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—209 17 Claims



1. Apparatus for generating a compatible wide-screen television signal comprising:

a solid-state imager including an array of photosensitive picture elements (pixels) arranged in rows and columns for developing an image-representative charge pattern in reponse to incident radiation, wherein the pixel distribution in a center portion of each row of said array is constant and a pixel distribution in the left and right edge portions of each row of said array is different from said pixel distribution in said center portion; and wherein

said center portion of each said row includes a greater number of pixels than said edge portions.

4,683,499

METHOD FOR GENERATING A PIXEL SYNCHRONIZING SIGNAL IN A PICTURE INPUT SCANNING APPARATUS AND A REPRODUCTION RECORD SCANNING APPARATUS AND APPARATUS THEREFOR

Akira Kuwabara, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 31, 1985, Ser. No. 816,169

Claims priority, application Japan, Jan. 11, 1985, 60-2056

Int. Cl.[4] H04N *1/36*

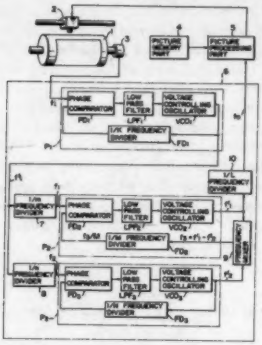
U.S. Cl. 358—264 6 Claims

1. A pixel synchronizing signal generating method in a picture input scanning apparatus and a reproduction record scanning apparatus characterized by comprising steps of:

dividing frequency of a reference signal according to main scanning speed of the picture scanning apparatus into a plurality of slightly different frequencies from one another by a plurality of frequency dividers;

converting pairs of said plurality of frequencies by at least a pair of phase synchronizing loop circuits coupled with heterodyne frequencies of mutual output frequencies;

dividing appropriately frequencies of output signals of phase synchronizing loop circuits of which feeding back signals



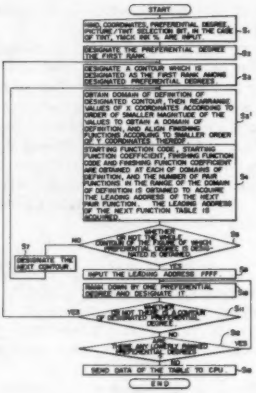
are said heterodyne frequencies among said phase synchronizing loop circuits to make them output frequencies.

4,683,500

METHOD FOR REPRODUCING PICTURE IMAGE

Hideaki Kitamura, Osaka; Syogo Fujiki, and Mitsuhiko Yamada, both of Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Oct. 25, 1985, Ser. No. 791,331
Claims priority, application Japan, Dec. 25, 1984, 59-272003
Int. Cl.[4] H04N *1/387*
U.S. Cl. 358—280 **3 Claims**



1. A method for reproducing picture images in which a plurality of original pictures scanned appropriately by more than two picture scanning input means are recorded on a recording surface of a picture scanning recording machine according to a predetermined layout, comprising the steps of:

inputting data regarding configurations and dispositions of more than one closed contour in accordance with said predetermined layout on said recording surface of the picture scanning recording machine and data regarding pictures to be recorded inside said closed contours by a data inputting means;

converting said input data regarding said configurations and said dispositions of said closed contours into closed contour data which are rearranged in order of having been recorded on the recording surface of said picture scanning recording machine;

storing these data together with data regarding pictures to be recorded in the insides of said closed contours by memory means;

reading said two kinds of recorded data out of said data memory means according to the order of their having been recorded on the recording surface of said picture scanning recording machine; and

recording a picture signal or a tint screen which is output from said picture scanning input means in accordance with these data in the inside of more than one closed contour;

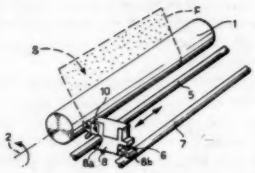
wherein in the case where said closed contours are represented by a function, data are input to said picture scanning recording machine in accordance with the order required by the function, and said input data are converted into closed contour data in the order of their having been recorded on the recording surface of said picture scanning recording machine.

4,683,501

APPARATUS FOR READING AND REPRODUCING GRAPHIC INFORMATION

Ugo Carena, Ivrea; Giuseppe Coli, Pavon Canavese, and Giuseppe Fogaroli, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 3, 1985, Ser. No. 783,352
Claims priority, application Italy, Oct. 3, 1984, 67982 A/84
Int. Cl.[4] H04N *1/024*
U.S. Cl. 358—293 **7 Claims**



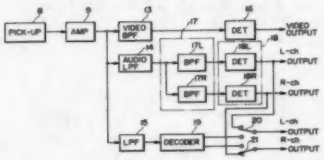
1. An apparatus for reading and reproducing graphic information comprising a cylindrical platen for supporting a sheet, advancing means for controlling the rotation of said platen in successive steps to effect a progressive longitudinal advancement of said sheet, a reciprocating carriage parallel to the axis of said platen to effect at each rotational step of said platen a transverse scanning movement with respect to said sheet, a dot matrix printing head mounted on said carriage for printing on said sheet a plurality of matrix dots arranged in a printing column parallel to said advancement, a dot sensing head including a plurality of photoelectric sensors for reading on said sheet a plurality of elemental areas arranged in a reading column corresponding to said printing column and each able to generate an electric signal indicative of the luminosity of the image in the elemental area being sensed, said sensors being arranged in a predetermined plane parallel to said reading column and said axis, at least a pair of light sources mounted within said housing for generating light beams intersecting on said reading column, an optical system mounted closely adjacent to said sources to form an image of the reading column in said predetermined plane, and housing means for mounting inside said sensors, said light sources and said optical system, said housing means being mounted on said carriage so that said light sources can direct the light beams toward a reading column adjacent and parallel to the printing column faced by said printing head.

4,683,502

VIDEO DISC TYPE RECORDING AND REPRODUCING SYSTEM WITH INTERFERENCE REDUCTION FILTER

Ryoji Higashi, and Satoru Nomura, both of Yamanashi, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,721
Claims priority, application Japan, Aug. 30, 1982, 57-149100; Mar. 18, 1983, 58-45780; Jul. 30, 1983, 58-119400[U]
Int. Cl.[4] H04N 5/85, 5/92
U.S. Cl. 358—342 8 Claims



1. A video disc type recording and reproducing system, comprising:

recording means, said recording means including: a first frequency modulator for modulating a video signal; a second frequency modulator for modulating at least an audio signal; a digital encoder connected in parallel with said second frequency modulator for digitally encoding said audio signal; filter means connected to an output of said first frequency modulator for removing a frequency component of the frequency-modulated video signal which covers a frequency component of the frequency-modulated audio signal from said second frequency modulator, said filter means comprising a high pass filter for passing only components having frequency higher than the lower secondary sideband of the modulated video signal; an adder circuit connected to an output of said filter means and to outputs of said second frequency modulator and digital encoder; a limiter connected to an output of said added circuit for pulse width modulating an output of said adder circuit; and an electrical/optical modulator connected to said limiter;

reproducing means, said reproducing means including: an information pick-up; an amplifier coupled to said pick-up; a video detector means for detecting the video signal component in the output of said amplifier to provide a video output signal; an audio detector means for detecting the audio signal component in the output of said amplifier to provide a first audio output signal; and a decoder means for decoding the digitally encoded audio signal component in the output of said amplifier to provide a second audio output signal.

4,683,503

INFORMATION SIGNAL REPRODUCING APPARATUS HAVING MEANS FOR DISCRIMINATING A TRACK PITCH AND SELECTING THE REPRODUCTION MODE SPEED

Hiroyuki Takimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,201
Claims priority, application Japan, Dec. 28, 1983, 58-245336
Int. Cl.[4] G11B 15/14, 5/52, 15/52
U.S. Cl. 360—64 20 Claims

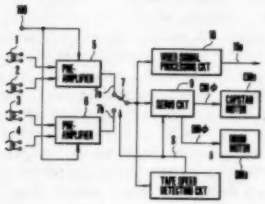
1. An information signal reproducing apparatus for reproducing information signals from a recording medium in which a large number of recording tracks, each having one of four kinds of pilot signals with different frequencies recorded successively on each track together with said information signals, are formed with either a first track pitch or a second track pitch, comprising:

(a) a first head having a head width which corresponds to said first track pitch;

(b) a second head having a head width which corresponds to said second track pitch;

(c) switching means for producing either of a signal reproduced by said first head from said recording medium and a signal reproduced by said second head from said recording medium, thus producing a reproduction signal;

(d) four detecting means for respectively detecting said four kinds of pilot signals included in said reproduction signal to produce four detecting signals;



(e) discriminating means for discriminating that all of said four kinds of pilot signals are included in said reproduction signal produced within a prescribed period of time based on said four detection signal; and

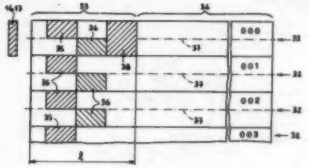
(f) switching control means arranged to change over the reproduction signal produced by said switching means between the signal reproduced by said first head and the signal reproduced by said second head in response to said discriminating means.

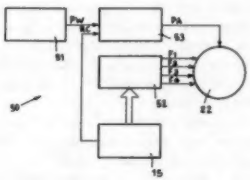
4,683,504

APPARATUS FOR RECORDING AND READING BINARY INFORMATION ON A MAGNETIC DISC

Giuseppe Cantello, S. Giusto C.SE, and Severino Concari, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 7, 1986, Ser. No. 816,796
Claims priority, application Italy, Feb. 21, 1985, 67177 A/85
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—78 7 Claims





1. A magnetic disc comprising a plurality of concentric recording tracks, each consisting of a useful zone for recording binary information and a function zone within a predetermined sector of the disc, and means identifying a reference circumfer-

ential position on the disc, each function zone including first and second information blocks which are both circumferentially and radially displaced relative to each other and can be sensed at times (ST1, ST2) fixed relative to a time (IM) corresponding to the reference circumferential position for providing servo control information to a control unit which controls the position of a magnetic head relative to a selected track, wherein the first and second information blocks occupy part only of the angular extent of the function zones and, within the spare part of the function zones of one only of the tracks of the disc has a third information block recorded therein to identify that track as a reference track.

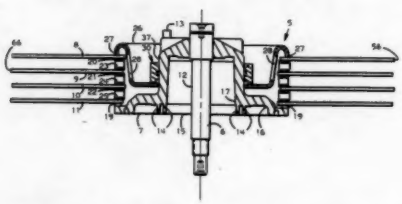
2. Apparatus for recording and reading binary information on a magnetic disc having a plurality of concentric recording tracks, comprising means for rotating the magnetic disc, at least one magnetic head for recording and reading information on the recording tracks, a stepping motor adapted to translate the magnetic head radially with respect to the disc to position it on a selected recording track, and a voltage source for supplying the stepping motor, a voltage boosting circuit interposed between the voltage source and the stepping motor, and means for providing an enabling signal (RC) such as to activate the voltage boosting circuit at the beginning of each shifting of the magnetic head towards a selected recording track and keep the voltage boosting circuit activated until such time as the magnetic head has reached the selected track, wherein the voltage source generates a d.c. voltage (PW) of constant value, and the voltage boosting circuit comprises an inductance coil, a diode and a capacitor connected in series between the d.c. voltage and earth, a switch being connected between the inductance coil and earth and a voltage (PA) of actual supply for the stepping motor being generated at an intermediated point between the diode and the capacitor.

4,683,505

ALTERNATELY CENTERED DISK PACK ASSEMBLY AND METHOD

Laurence J. Schmidt; Randall L. Severson, both of Rochester; Lyle R. Tufty, Elgin, and Steven H. Voss, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,433
Int. Cl.[4] G11B *5/012, 23/03*
U.S. Cl. 360—98 **12 Claims**



1. A disk pack assembly for use in a disk drive wherein the disk pack assembly is rotated within the disk drive apparatus, the disk pack assembly comprising:

spindle hub means rotatingly coupled to the disk drive apparatus for providing a spindle about which the disk pack assembly is rotated;

first disk means coupled to the spindle hub means for storing information and having an outer diameter substantially equal to a desired diameter; and

second disk means coupled to the spindle hub means a desired distance from the first disk means along the spindle hub means for storing information and having an outer diameter substantially equal to the desired diameter;

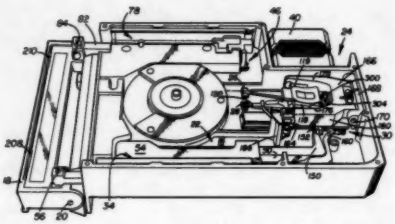
wherein opposite edges of adjacent disk means are diametrically offset about the spindle hub means so that said opposite edges are at a distance from the axis of the spindle hub means substantially equal to the desired diameter.

4,683,506

DISC DRIVE ARRANGEMENT FOR A HARD DISC CARTRIDGE WITH A READ/WRITE HEAD RETRACT MECHANISM

George Toldi, Santa Clara; Anil Nigam, Cupertino; Ronald Crain, and Dominic Mercurio, both of San Jose, all of Calif., assignors to Syquest Technology, Fremont, Calif.

Filed Aug. 4, 1983, Ser. No. 520,256
Int. Cl.[4] G11B *5/54, 21/22, 5/012, 5/016*
U.S. Cl. 360—105 **8 Claims**



1. A disc drive arrangement for accessing information from and recording information into a disc retained in a cartridge, which cartridge is insertable into the disc drive, comprising:

a housing;

a door;

means for mounting the door to the housing;

at least one head;

a carriage for mounting and transporting said head;

means for movably mounting said carriage to said housing; and

linkage means for operatively connecting said door to said carriage for urging said carriage and head away from the cartridge when said door is open;

said linkage means including a linkage arrangement which is operatively connected to the door and an arm means for selectively engaging said carriage;

said linkage arrangement includes a link means which means rearwardly as said door is opened for engaging said arm means;

said arm means having a cammed surface;

means for mounting said arm means with the cammed surface engageable with said link means so that as said link means is urged against said cammed surface of said arm means as said door is opened, said arm means in urged rearwardly along the line of travel of said link means in a more accelerated manner than the movement of said link means and said arm means simultaneously urges said carriage rearwardly away from said cartridge and thereby precluding contact between said head and the cartridge.

4,683,507

FIXED/ADJUSTABLE HEAD MOUNT

Clyde D. Roberts, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed Jun. 17, 1985, Ser. No. 745,090
Int. Cl.[4] G11B *5/56, 21/24*
U.S. Cl. 360—109 **2 Claims**

1. A device for a magnetic tape comprising:

a deck having two spaced apart support surfaces in a plane, and having a threaded opening in each support surface;

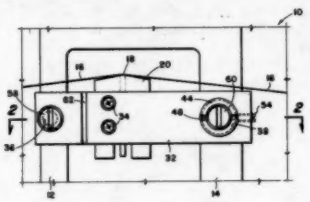
a skew plate having a rearward surface and having spaced apart first and second openings therein in alignment with said support surfaces threaded openings, the second opening being threaded, the skew plate having a slot thereacross adjacent said first opening to permit flexing of said

skew plate, the slot being in a plane perpendicular to the plane through said skew plate openings;

a read/write head affixed to said skew plate rearward surface between said slot and said second opening and having a longitudinal read/write surface thereacross engageable by a magnetic tape, the longitudinal read/write surface extending generally perpendicular to said skew plate rearward surface;

a first screw received in said first opening in said skew plate and in said threaded opening of one of said deck support surfaces;

a cup screw received in said skew plate threaded opening, the cup screw having a recess therein and an unthreaded opening therethrough;



a second screw received in said cup screw and the other of said deck support surface threaded openings, the second screw having a head therein engaging said cup screw within said recess therein;

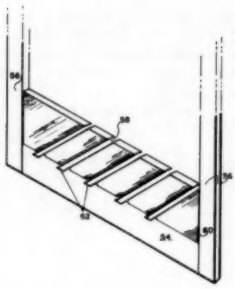
and a spring washer positioned between said skew plate rearward surface and said deck support surface and receiving said second screw to bias said skew plate away from said deck support surface, whereby the azimuth angle between said read/write surface and the plane of said deck surface is adjustable by means of the said two distinct threaded adjustments the action of and said spring washer.

4,683,508

MAGNETO-RESISTIVE HEAD WITH REDUCED THERMAL NOISE

Frederick J. Jeffers, Escondido, and John L. Simonds, San Diego, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1985, Ser. No. 693,957
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **6 Claims**



1. A sensor for use in a magneto-resistive head comprising

a. means supporting an elongated film of magneto-resistive material, said elongated film connected to a pair of electrical leads, one lead located on each side of said film, and said elongated film having a first region adjacent to a magnetic recording medium and a second region having one or more generally crosswise slots therein for preventing current flow within said magneto-resistive film in the second region, and

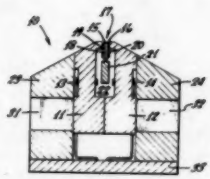
b. thermally conductive means on said magneto-resistive film exclusively in the region thereof having said slots.

4,683,509

HIGH EFFICIENCY MAGNETIC ERASE HEAD

Bruce L. Steele, Rancho California, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jun. 15, 1984, Ser. No. 621,230
Int. Cl.[4] G11B *5/23, 5/325*
U.S. Cl. 360—119 **7 Claims**



1. A magnetic transducer capable of diverting magnetic flux flowing therein toward an adjacent magnetic media comprising:

first and second pole pieces made of ferrite material and respectively having end faces spaced apart to define a gap therebetween above which said magnetic media may be located;

a first conductive gap material positioned in said gap between said end faces such that an alternating magnetic flux flow between said faces will induce a first eddy current in said first conductive gap material and thereby inhibit said alternating magnetic flux from flowing through said first conductive gap material;

a conductive bar insulated electrically from said first conductive gap material and positioned below said gap such that a portion of said alternating magnetic flux flowing below said gap, through said conductive bar, will induce a second eddy current therein and thereby inhibit said portion of said alternating magnetic flux from flowing below said gap; said first conductive gap material and said conductive bar thus diverting magnetic flux to flow above said gap; and

a gap spacer made of ferrite material positioned in said gap between said end faces,

wherein said conductive bar is bonded to said gap spacer.

4,683,510

LOCK MECHANISM FOR TAPE PROTECTIVE CLOSURE FOR MAGNETIC TAPE CASSETTE

Niroshi Meguro, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 711,521
Claims priority, application Japan, Apr. 10, 1984, 59-71462
Int. Cl.[4] G11B *23/087, 15/32*
U.S. Cl. 360—132 **20 Claims**

1. A magnetic tape cassette comprising:

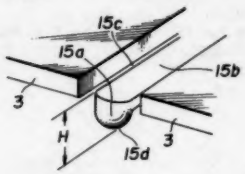
a cassette casing having a mouth through which a magnetic tape is accessible, said mouth including a first opening in a front end face of said casing and a second opening in a lower section of the casing adjacent said front end face;

a pivotal lid pivotable between a closed position covering said first opening of said mouth and an open position exposing said first opening of said mouth;

a sliding shutter member slidable with respect to a lower section of said cassette casing between a first position in which it covers said second opening and a second position in which it exposes said second opening; said shutter member including first and second means for engagingly

receiving a locking head of a locking lever at first and second positions of said shutter; and

a resilient locking lever integrally formed with said cassette casing and having a resiliently deformable lever and a locking head engageable with said shutter member, said locking lever normally holding said shutter member in



said first position while said cassette is not in use, and allowing said shutter member to move to said second position when said cassette is inserted into an associated recording and reproducing apparatus, and holding said shutter member at said second position while said cassette is used.

4,683,511

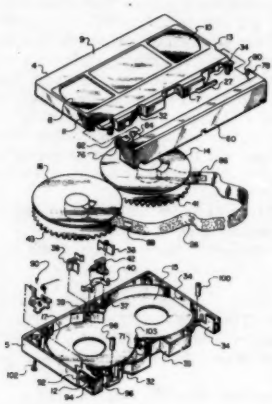
HEAD AND GUIDE CLEANING DEVICE FOR VIDEO TAPE RECORDER

Stephen Kara, 2609 Sapra St., Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 325,923, Nov. 30, 1981, Pat. No. 4,462,056. This application Oct. 28, 1983, Ser. No. 546,506

Int. Cl.[4] G11B *23/02, 5/025, 5/008, 15/00*

U.S. Cl. 360—132 **8 Claims**



1. In a cleaning device for a video tape recorder of the type adapted to move a video tape between two reels along a predetermined path in moving contact with a plurality of operating heads and tape guides, the cleaning device having a cassette housing adapted to be inserted into the recorder in the manner of a video tape cassette, the cassette housing having a front wall with at least one indentation for receiving a tape contacting member of the video tape recorder, which is movable from a position in the indentation to a position out of the indentation, a pair of tape reels rotatably supported within the housing, a cleaning tape carried on the reels and adapted to be advanced by the video tape recorder along the recorder tape path from one reel to the other reel in moving contact with the operating heads and tape guides when the cassette housing is inserted into the recorder and the recorder operated, wherein the improvement comprises:

blocking means fixed to the front wall of the cassette housing extending into one of the indentation for blocking the movement of the movable tape contacting member from within the indentation to without the indentation.

4,683,512

DEVICE FOR VARIABLY ADJUSTING A MOMENT OF INERTIA OF A DRUM OF A VIDEOCASSETTE RECORDER

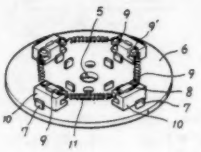
Soo K. Kim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 8, 1986, Ser. No. 883,267

Claims priority, application Rep. of Korea, Jul. 8, 1985, 4873/1985

Int. Cl.[4] G11B *00/00*

U.S. Cl. 360—137 **1 Claim**



1. A device for variably adjusting a moment of inertia of a drum of a videocassette recorder, said drum including upper and thereof to a motor, the device comprising:

a disc-shaped plate fixedly mounted to a rotor of said motor and provided at the center portion thereof with a hole for receiving said rotating shaft;

a plurality of protrusions radially arranged at concentric circles on said plate, said circles being spaced at different radial distances from the center of said rotating shaft, respecively;

a plurality of inertial masses separably coupled to selected protrusions of said plate, respectively; and

a plurality of springs each connecting adjacent inertial masses, whereby a moment of inertia of the drum can be variably adjusted depending upon the selective coupling of said inertial masses to selected protrusions of said plate.

4,683,513

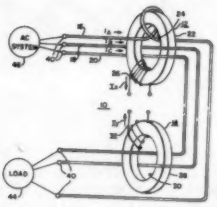
DUAL CURRENT TRANSFORMER CURRENT SENSING METHOD AND SENSOR

Robert C. Miller, Salem Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 7, 1986, Ser. No. 848,541

Int. Cl.[4] H02H *3/26*

U.S. Cl. 361—76 **10 Claims**



1. In a three phase ac system definable by positive, negative and zero sequence currents providing power to an electrical load via a current carrying conductor for each phase where

current in the conductors is sensed using current transducers, each current transducer comprising a core having a window therethrough for receiving one or more of the current carrying conductors and having a winding disposed thereon for producing an electrical output signal, a method of producing the electrical output signal indicative of the sum of the three phase current and phase imbalance of the load, comprising the steps of:

providing a first current transducer;

providing a second transducer wherein the number of turns in the winding thereof is substantially equal to $\sqrt{3}$ times the number of turns in the winding of the first current transducer;

passing the conductor of said one of phases twice through the window of the first current transducer;

passing the cunductors of the other two of the phases through the window of the first current transducer such that the current flow therein is in the same direction with respect to one another but opposite in direction to the current flow of the conductor passing twice through the window of the first current transducer;

passing the conductors of the two phases that each pass once through the first current transducer through the window of the second current transducer such that the direction of the current flow in one of the phases is opposite to the direction of current flow of the other phase;

squaring the output of the winding of the first current transducer;

squaring the output of the winding of the second current transducer; and

summing together the squared outputs of the first and second current transducers whereby the summed outputs have a dc term substantially proportional to the average value of the sum of the squares of the current flowing in the conductors and an ac term substantially proportional to phase imbalance and being substantially at twice the frequency of the current and substantially proportional to the product of the positive and negative sequence currents.

4,683,514

SURGE VOLTAGE PROTECTIVE CIRCUIT ARRANGEMENTS

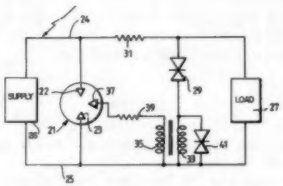
Kenneth G. Cook, Middlesex, England, assignor to The M-O Valve Company Limited, England

Filed Oct. 1, 1985, Ser. No. 782,434

Claims priority, application United Kingdom, Oct. 3, 1984, 8424907; Apr. 19, 1985, 8510051

Int. Cl.[4] H02H 9/04

U.S. Cl. 361—91 **2 Claims**



1. An electrical circuit arrangement for protecting a load connected across an electrical supply against surge voltages, comprising:

(a) a resistance connected in one of a pair of supply lines which run from an electrical supply to a load, said resistance having a supply side and a load side;

(b) a first voltage arrester including a gas-filled enclosure in which two main electrodes and a trigger electrode are housed, said main electrodes being spaced apart to form a discharge gap having a predetermined breakdown voltage, one of the main electrodes being connected to the supply side of the resistance in said one supply line, and the other of the main electrodes being connected to the other of the supply lines;

(c) a second excess voltage semiconductor arrester having a breakdown voltage lower than said predetermined breakdown voltage, said second arrester being connected between the load side of the resistance in said one supply line and said other supply line;

(d) firing means operative in response to breakdown of the second arrester, for applying a voltage between the trigger electrode and one of the main electrodes of the first arrester to thereby reduce the predetermined breakdown voltage,

said firing means including a step-up transformer having a first winding connected in series with the second arrester, and a second winding in series with the trigger electrode; and

(e) a third arrester being connected in parallel with the first winding.

4,683,515

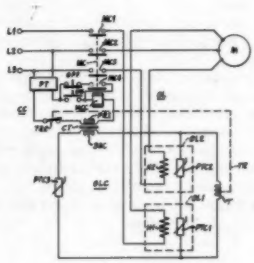
MODULAR PTC THERMISTOR OVERLOAD PROTECTION SYSTEM

Bruce C. Beihoff; Avie Judes, both of Glendale, and Michael S. Baran, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 20, 1985, Ser. No. 800,174

Int. Cl.[4] H02H 7/08

U.S. Cl. 361—106 **14 Claims**



1. A modular thermistor overload protection system comprising:

a power circuit including an electrical power supply source and a load device;

switching means operable to connect said load device to said source and to disconnect said load device therefrom thereby to selectively energize or deenergize said load device;

control means for operating said switching means;

and protective means operable to sense an overload trip current in said power circuit and trip said switching means so as to cause said switching means to disconnect said load device from said source comprising:

trip means for directly tripping said switching means without delay;

a thermistor sensor in circuit with said trip means and having a switching temperature level at which its resistance abruptly changes;

a control circuit for applying an electrical bias to said thermistor sensor;

heater means responsive to an overload trip current in said power circuit for heating said thermistor sensor to its switching temperature level whereby its abrupt change in resistance causes direct operation of said trip means;

and the speed of operation of said protective means being fast enough due to said direct operation of said trip means so that said trip means will always trip before said switching means has had time to operate long enough to apply

enough power to cause motor energization if said control means is operated to apply power under overload conditions.

4,683,516

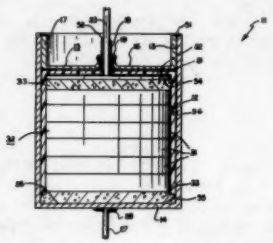
EXTENDED LIFE CAPACITOR AND METHOD

John R. Miller, Shaker Heights, Ohio, assignor to Kennecott Corporation, Cleveland, Ohio

Filed Aug. 8, 1986, Ser. No. 894,673

Int. Cl.[4] H01G *4/38, 9/00*

U.S. Cl. 361—328 **28 Claims**



1. An extended life capacitor comprising, in combination:

an enclosing body having an interior surface formed from a material highly resistance to corrosion by the electrolyte of the capacitor;

a plurality of double layer capacitor cells inside said enclosing body and having first and second electron-conducting end members;

said plurality of capacitor cells including a high surface area carbon material impregnated with an electrolyte;

means providing electrical connection external to said body, mutually insulated, to said first and second end members of said plurality of capacitor cells as anode and cathode;

means to inhibit the loss of electrolyte from the interior to the exterior of said capacitor body; and

said inhibiting means including an hermetically sealed body and high purity components.

4,683,517

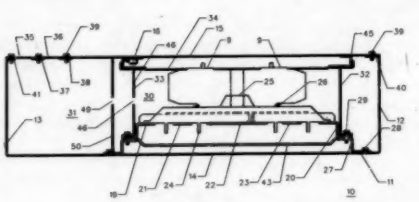
INTEGRATED LIGHTING PANELBOARD AND WIRING GUTTER ASSEMBLY

Thomas A. Yazvac, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,248

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—358 **8 Claims**



1. An integrated electrical panelboard and wiring gutter assembly comprising:

a rectangular enclosure including a bottom plate supporting a pair of first and second opposing sidewalls, said first and second sidewalls each terminating in an angled rim on a surface opposite said bottom plate;

a rectangular door flange and door on said enclosure defining a first interior within said enclosure;

circuit breaker support means carrying a plurality of circuit breakers within said first interior and attached to said bottom plate; and

a first rectangular trim plate having a first planar edge and an opposing offset edge, both said first planar edge and said first offset edge including a pair of first apertures, said first rectangular trim plate being fastened to said first angled rim on said first planar edge and to said door flange on said first offset edge, said first rectangular trim plate thereby defining a second interior within said enclosure coextensive with said first interior for housing electrical power distribution cables.

4,683,518

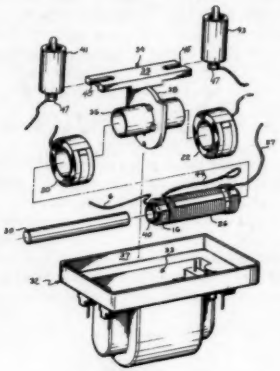
IGNITION FOR OIL BURNER

Adam A. Gwozdz, Chicopee, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Nov. 17, 1986, Ser. No. 931,207

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 361—263 **6 Claims**



1. Oil burner igniter having a transformer with a primary winding and secondary winding connected to electrodes for providing an ignition spark, a feedback coil is inductively coupled to the primary coil and a transistor is connected in circuit with an input energy source and the primary coil, the improvement comprising said primary winding and feedback coil being continuously wound and disposed about the circumference of a ferromagnetic core, a secondary winding disposed about the circumference of the primary winding and feedback coil in inductively coupled radial relationship, said primary winding, feedback coil and secondary coil all being disposed in axially coextensive relation about said core.

4,683,519

CONNECTION STRUCTURE

Osamu Murakami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,960

Claims priority, application Japan, Oct. 30, 1984, 59-226748

Int. Cl.[4] H05K *9/00*

U.S. Cl. 361—424 **13 Claims**

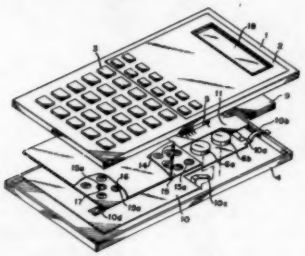
9. A connection structure for electrically and mechanically connecting electronic components comprising:

an insulating sheet having first and second opposed surfaces and having a plurality of holes;

a first flexible printed circuit board formed of an insulating material having first and second opposed surfaces with said first surface being disposed adjacent and facing said first surface of said insulating sheet and being provided with an electric circuit including a plurality of contacts

disposed at positions facing respective said holes in said insulating sheet;

a second flexible printed circuit board formed of insulating material and having first and second opposed surfaces, with said first surface of said second printed circuit board being provided with an electric circuit containing a plurality of contacts disposed opposite said holes and being disposed so that it is adjacent and facing said second surface of said insulating sheet;



pressing means including a first pressing portion for pressing respective said contacts of said first printed circuit board against corresponding said contacts of said second printed circuit board via respective said holes formed in said insulating sheet, and a second pressing portion for pressing respective said contacts of said second printed circuit board against corresponding said contacts of the first printed circuit board via respective said holes in said insulating sheet.

4,683,520

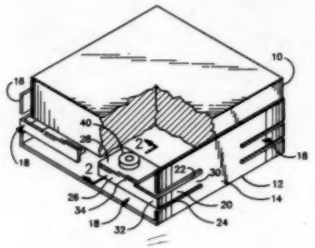
MECHANICAL SHOCK MOUNT SYSTEM FOR ELECTRICAL APPARATUS

Leonardus J. Grassens, and Peter J. Janssen, both of Colorado Springs, Colo., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Jul. 14, 1986, Ser. No. 885,351

Int. Cl.[4] H02B *1/02*; H05K *7/02*

U.S. Cl. 361—427 **4 Claims**



1. A shock mount for mounting an electrical apparatus to a chassis comprising: a resilient buffer mounted to said apparatus for compressive shock absorption along a first line; and an L-shaped arm having a first arm portion and a second arm portion, said first arm portion extending along a second line normal to said first line, said first arm portion having support means supporting said resilient buffer at one end thereof, said second arm portion extending along a third line normal to said first and second lines, one end of said second arm portion being joined to the end of said first arm portion opposite the end supporting said resilient buffer and the other end of said second arm portion joined to and integral with said chassis, said L-shaped, are being so sized as to support bending and torsional loads to absorb mechanical shock.

4,683,521

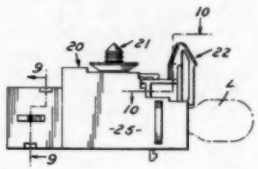
UNDER HOOD AND LUGGAGE COMPARTMENT LAMP ASSEMBLY

Nicholas A. Poleschuk, Farmington, and LeRoy A. Poleschuk, Warren, both of Mich., assignors to Beta Manufacturing Corp., Warren, Mich.

Filed Mar. 7, 1986, Ser. No. 837,300

Int. Cl.[4] F21V *21/00, 23/04*

U.S. Cl. 362—80 **20 Claims**



1. An under hood and luggage compartment lamp assembly which is adapted to be positioned on a hood or luggage compartment of a vehicle comprising

a plastic body having at one end, a first set of spaced terminals the outer end of which extend parallel for connection to a plug of a wiring harness and at the other end a second set of spaced terminals the outer end of which are shaped for receiving a wedge based lamp,

a mercury switch in said body having a spherical contact and a button contact,

the inner end of one of the first set of terminals being bent and resiliently engaging the spherical contact of said mercury switch and the inner end of one of the second set of terminals being bent to engage the button contact of the mercury switch,

the inner end of the other of the first set of terminals directly engaging the inner end of the other of the second set of terminals

the body being provided with projections and recesses for locating the terminals and mercury switch such that they can be dropped in place during assembly,

a cover closing said body.

4,683,522

SUN VISOR FOR VEHICLES

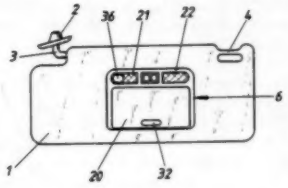
Lothar Viertel, Berus/Uberherrn, and Klaus-Peter Kaiser, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,385

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427952

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—135 **6 Claims**



1. A sun visor for a vehicle, comprising:

a flat sun-visor body with two opposite main surfaces; a recess in one of the surfaces; a housing in the recess, a

mirror in the housing; an illuminating device in the housing at the mirror;

the housing comprising a trough-shaped bottom part attached to the visor body, a top part detachably connected to the bottom part; a light source in the bottom part;

the top part is an insert; the mirror being included in the top part; a cover over the mirror, the cover displaceable over the mirror selectively to cover the mirror and to be off the mirror to expose the mirror; an illumination window for permitting light from the light source to shine through; and

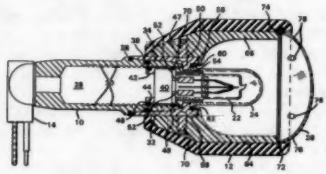
a spring attached to the cover for normally urging the cover into the open condition uncovering the mirror; releasable closure means for holding the cover closed against the bias of the spring; the closure comprising an opening in the bottom part and comprising a spring-loaded pin extending from the cover into the opening in the bottom part, the pin being shaped such that pushing upon the pin against the spring loading releases the cover to move open under the bias of the spring for the cover.

4,683,523

DEEP SUBMERSIBLE LIGHT ASSEMBLY

Mark S. Olsson, 4968 Diane Pl.; William H. Hagey, 3653 Jennifer St., both of San Diego, Calif. 92117, and Brock J. Rosenthal, 230 Fourth St., Del Mar, Calif. 92014

Filed Jun. 13, 1986, Ser. No. 874,271
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—267 **10 Claims**



1. A submersible light assembly, comprising:

a hollow body having at least one opening;

a lamp socket;

means for holding the lamp socket in a predetermined position within the body;

a lamp having contacts removably inserted in the socket and a bulb extending through the opening and having a base connectable with the socket;

a transparent cylindrical envelope enclosing a portion of the lamp and having a closed forward end an an open rearward end with a radially outwardly projecting shoulder, the shoulder having a flat rearward face extending perpendicular to a longitudinal axis of the envelope, a cylindrical outer surface extending forward from the rearward face, and a radially tapered outer surface forward of the cylindrical surface and decreasing in diameter moving in a forward direction; and

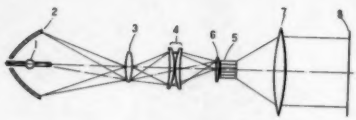
means for holding the rearward end of the transparent envelope to the body including means connected to the body for defining a cylindrical cavity adjacent the opening, the rearward face of the transparent envelope being abutted against a rearward wall of the cavity, an O-ring radially seated in the cavity surrounding the cylindrical outer surface of the shoulder of the transparent envelope, and means for engaging the tapered outer surface of the shoulder and pressing the O-ring and the rearward face of the shoulder against the rearward wall of the cavity.

4,683,524

ILLUMINATION APPARATUS

Masakatsu Ohta, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 720,610, Apr. 8, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 919,377
Claims priority, application Japan, Apr. 13, 1984, 59-75388
Int. Cl.[4] F21V *7/04*; G03B *27/02*
U.S. Cl. 362—268 **8 Claims**



1. An illumination apparatus, comprising:

a light source;

an elliptical mirror for forming an image of said light source;

an imaging system for re-imaging the image formed by said elliptical mirror, while causing a curvature of field;

a multi-beam generating system for producing, from a light beam emitted from said light source, a number of discrete light beams, said multi-beam generating system having an input surface disposed in a predetermined relation to the image of said light source formed by said imaging system; and

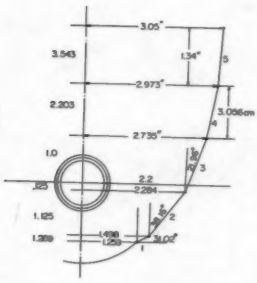
a collimating system for collimating each of the discrete light beams emerging from said multi-beam generating system.

4,683,525

LAMP HAVING SEGMENTED REFLECTOR

David M. Camm, Vancouver, Canada, assignor to Fusion Systems Corporation, Rockville, Md.

Continuation of Ser. No. 707,159, Mar. 1, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 928,649
Claims priority, application Japan, Mar. 1, 1984, 59-39719
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—346 **14 Claims**



1. A lamp for providing both substantially uniform light flux and small average local divergence over the extent of a target of variable transparency to be illuminated, comprising

a light source for emitting radiation, and

a reflector in which said light source is disposed,

said reflector having an axis and being comprised of a plurality of annular reflecting segments which are symmetrical with respect to said axis and which are arranged with respect to said source and the area of a target of variable transparency to be illuminated so that the points on said target receive radiation which is reflected from a plurality of different segments with points on the target which are

closer to the periphery thereof receiving radiation which is reflected from a greater number of segments then points which are closer to the center of the target in such manner that due to the increase in target area in the direction from the target center to periphery the radiation incident across the entire target area is substantially uniform, and whereby the radiation incident on the variable transparency target is averaged over the reflecting segments and the average local divergence of such radiation is minimized.

4,683,526

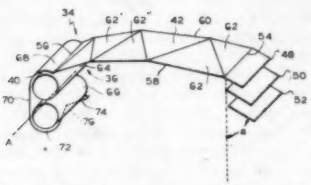
ASYMMETRIC LAMP

Jens C. Krogsrud, Oslo, Norway, and Kai O. Sorensen, Lyngby, Denmark, assignors to Jac Jacobsen A/S, Norway

Continuation of Ser. No. 795,638, Nov. 6, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 931,945

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—346 **20 Claims**



1. A lamp, comprising:

a head, a faceted top reflector; a rear reflector; and a socket means for receiving a light source, the socket means being rearwardly mounted in the head, said light source defining a vertical plane generally parallel to said rear reflector, said light source also defining a horizontal line in said plane, said rear reflector being located generally rearward of said light source, said top reflector being located generally above said light source;

said faceted top reflector having a generally parabolic longitudinal cross-sectional shape, said top reflector including a plurality of triangular facets, adjacent facets defining lines that are nonparallel to said horizontal line defined by the light source, said top reflector having a front edge, a rear edge, and first and second side edges;

said rear reflector having an upper portion and a lower portion, said upper portion being located rearward of said rear edge of said top reflector, said lower portion generally conforming to the contours of said light source and extending forward of said vertical plane, said lower portion including a notch.

4,683,527

AC/DC OR DC/AC CONVERTER SYSTEM WITH OUTBOARD COMMUTATION INDUCTORS

John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 13, 1986, Ser. No. 896,027

Int. Cl.[4] H02M *7/70*

U.S. Cl. 363—5 **6 Claims**

1. In an AC/DC converter system interconnecting AC phase lines with two direct current (DC) terminals defining opposite poles for such converter, the converter system including 12 rectifying devices equally distributed about twelve successive phase voltages oriented vectorially in a star-fashion and at 30 degrees to one another;

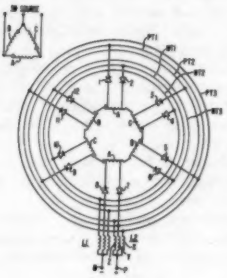
one set of 6 of said rectifying devices being associated with one DC terminal, a second set of 6 of said rectifying devices being associated with the other DC terminal;

said rectifying devices becoming operatively conducting between said DC terminals in cyclic sequential order so that two commutating devices are commutating one another from one phase voltage to the next phase voltage at 60 degrees phase shift; the combination of:

in each of said two sets of rectifying devices three pairs of rectifying devices are arranged in a staggered fashion so that one rectifying device of a pair is next in said sequential order of conduction relative to another rectifying device of another pair;

while being associated with a rectifying device ranking third in said sequential order and belonging to the third pair of such set;

a group of three inductors being provided for each of said sets of rectifying devices, each such group being connected between the associated pole and the respective pairs of rectifying devices;



two inductors of a group being operatively associated with the two commutating rectifying devices in said sequential order;

the other inductor of said group being associated with the third rectifying device which is in sequential order relative to said two commutating rectifying devices;

such two inductors of a group being effective to reduce the rate of change of the commutating currents in both of said two commutating rectifying devices so as to extend the duration of the attending commutation and reduce the harmonics of the currents drawn from said phase lines, and said pair of inductors being effective via said other inductor of said group to prevent interference by said third rectifying device upon the commutation of said commutating devices.

4,683,528

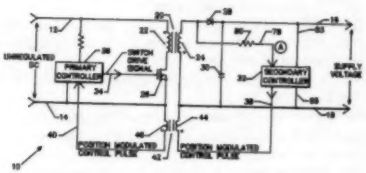
PULSE POSITION MODULATED REGULATION FOR POWER SUPPLIES

Dane R. Snow, Santa Clara, and David Bingham, San Jose, both of Calif., assignors to Intersil, Inc., Cupertino, Calif.

Filed Jul. 22, 1985, Ser. No. 757,808

Int. Cl.[4] H02M *3/335;* **363** *21, 25, 26, 97, 131, 134*

U.S. Cl. 363—21 **2 Claims**



1. A power supply for providing a regulated supply voltage, said power supply comprising:

a transformer with a primary winding and a secondary winding;

a switching device connected to said primary winding for

controlling the duty cycle of the power delivered to said primary winding;

a primary controller coupled to said switching device for driving said switching device;

a secondary controller coupled to said secondary winding for generating a position modulated control pulse, the timing of said control pulse being generated in accordance with any error between the supply voltage and its regulated value, said secondary controller including amplifier means for amplifying the difference between said error and a reference signal to provide a current source control signal, sawtooth generator means for generating a periodic sawtooth waveform in which the slope of the sawtooth waveform is proportional to said error and comparison means for comparing the sawtooth signal to said reference signal and providing an output signal when the sawtooth signal exceeds said reference signal, said sawtooth generator means including a storage capacitor, means for cyclically discharging the capacitor and variable current source means responsive to said current source control signal for providing current to said storage capacitor to charge said storage capacitor at a rate in accordance with the magnitude of the current source control signal; and

a pulse transformer for coupling said position modulated control pulse from said secondary controller to said primary controller;

whereby feedback information is transmitted from the power supply output to the power supply input across the isolation boundary of said transformer.

4,683,529

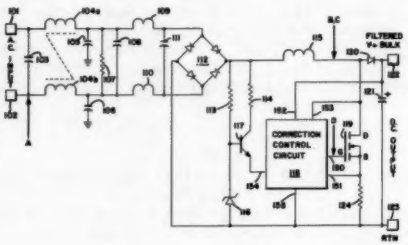
SWITCHING POWER SUPPLY WITH AUTOMATIC POWER FACTOR CORRECTION

James D. Bucher, II, St. Paul, Minn., assignor to Zytec Corporation, Eden Prairie, Minn.

Filed Nov. 12, 1986, Ser. No. 929,603

Int. Cl.[4] H02M *7/217, 1/12*

U.S. Cl. 363—44 **11 Claims**



1. An off-line switching power supply with automatic power factor correction, comprising:

input connection means for connecting to a power source and for receiving input current;

first rectifier means connected to said input connection means for rectifying said input current and for producing rectified input current;

inductor means for charging and discharging said rectified input current;

switching means connected to said inductor means and to said first rectifier means for placing said inductor means in a first position so that said rectified input current from said first rectifer means is charged in said inductor means and for placing said inductor means in a second position so that said charged rectified input current is discharged from said inductor means;

second rectifier means connected to said inductor means for receiving said discharged rectified input current and for producing rectified inductor current when said inductor means is placed in said second position by said switching means;

capacitor means connected to said second rectifier means for receiving said rectified inductor current, for charging the voltage produced when said inductor means is placed in said second position by said switching means and for discharging regulated direct current and voltage;

output connection means connected to said capacitor means for driving a load with said discharged regulated direct current and voltage;

control means connected to said switching means for alternately placing said inductor means in said first and said second positions, which comprises:

on-time amplifier means connected to said capacitor means for generating an on-time error signal in response to said voltage across said voltage capacitor;

off-time amplifier means connected to said voltage storage means for generating an off-time error signal in response to said voltage across said voltage storage means;

reset detect means connected to said second rectifier means for generating a reset signal when said rectified inductor current through said second rectifier means is approximately zero;

clock circuit means for producing a high frequency clock signal to control said switching means having an on-time interval corresponding to the amount of time said switching means places said inductor means in said first position and having an offtime interval corresponding to the amount of time said switching means places said inductor means in said second position;

the length of said on-time interval controlled by the magnitude of said on-time error signal; and

the length of said off-time interval controlled by said reset signal and said off-time signal so that said reset signal operates to terminate said off-time interval and said off-time error signal operates to extend the off-time interval beyond the termination point set by said reset signal.

4,683,530

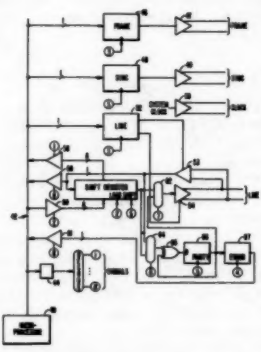
SERIAL INFORMATION TRANSFER PROTOCOL

Jesse T. Quatse, Corte Madera, Calif., assignor to Telemecanique Electrique, Nanterre Cedex, France

Filed Apr. 10, 1984, Ser. No. 598,644

Int. Cl.[4] G06F *13/42*

U.S. Cl. 364—200 **14 Claims**



1. In an information processing system an apparatus for transferring information between a central processing unit (CPU) and at least one peripheral module, the apparatus comprising:

line means coupled to said CPU and to said at least one peripheral module for providing serial transmission of address signals and serial bidirectional transmission of data signals;

means coupled to said at least one peripheral module for generating a frame signal, said frame signal having a first transition for initiating an address transmission phase and a second transition for terminating a data transmission phase;

means coupled to said at least one peripheral module for generating a clock signal for defining a synchronous transmission rate during the data transmission phase and the address transmission phase;

means coupled to said at least one peripheral module for generating a sync signal for terminating the address transmission phase and for delimiting data fields transmitted during the data transmission phase; and

means coupled to said line means and to said sync signal generating means and responsive to a first transition of said sync signal for generating on said line means an acknowledgement (ack) signal having a first transition verifying correct receipt of signals transmitted on said line means;

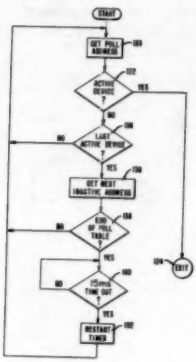
said sync signal generating means being further operative to cause a second transition of said sync signal in response to the first transition of said ack signal and said ack signal generating means being further operative to cause a second transition of said ack signal in response to the second transition of said sync signal.

4,683,531

POLLING METHOD FOR DATA PROCESSING SYSTEM

Russell K. Kelch, Senecaville; Don C. Finfrock, Cambridge; Donald J. Girard, Cambridge; Daniel B. Seevers, Cambridge; Barry D. Briggs, New Concord, and Gene R. Mathes, Zanesville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 2, 1984, Ser. No. 627,253
Int. Cl.[4] G06F *13/22*
U.S. Cl. 364—200 **5 Claims**



1. A method for polling during a processing operation a plurality of active and inactive remote processing units interconnected in a communication network with a master processing unit having a memory comprising the steps of:

(a) sequentially transmitting a status message from the master processing unit to each of the remote processing units prior to the start of the processing operation;

(b) transmitting a response message to the master processing unit from a remote processing unit that is active in response to receiving the status message;

(c) establishing in the memory a table of first and second bytes of binary signals in accordance with the response received to the status message in which each first byte of binary signals represents an active remote processing unit that has transmitted a response message to the master processing unit and each second byte of binary signals represents an inactive remote processing unit in the communication network that has not transmitted a response message to the master processing unit;

(d) sequentially transmitting a polling message to each active remote processing unit in the order listed in the table;

(e) at the conclusion of transmitting a polling message to the last active remote processing unit listed in the table, transmitting a polling message to the first inactive remote processing unit listed in the table;

(f) after transmitting a polling message to the first inactive remote processing unit, repeating step (d);

(g) at the conclusion of transmitting a polling message to the last active remote processing unit listed in the table, transmitting a polling message to the next inactive remote processing unit listed in the table;

(h) repeating steps (d), (e), (f) and (g) until all of the active and inactive remote processing units listed in the table have been polled;

(i) generating first and second time-out periods by the master processing unit at the start of transmitting a polling word to an inactive processing unit;

(j) storing a third byte of binary signals in the poll table representing the inactive device polled if the inactive device does not respond within the first time-out period; and

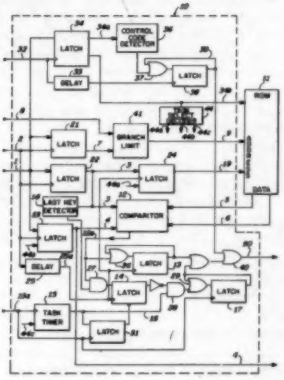
(k) changing the third byte of binary signals representing the inactive processing unit polled to said first byte of binary signals upon receiving a response message from the inactive processing unit polled to the transmission of the polling word within said second time-out period.

4,683,532

REAL-TIME SOFTWARE MONITOR AND WRITE PROTECT CONTROLLER

Larry J. Yount, Scottsdale; Nicholas J. Wilt, Phoenix; Bryan H. Hill, Phoenix, and Donald A. Peterson, Jr., Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 3, 1984, Ser. No. 677,275
Int. Cl.[4] G06F *11/30*
U.S. Cl. 364—200 **4 Claims**



1. Real-time software monitor and write protect apparatus comprising:

means for providing a sequence of memory addresses in response to input of a sequence of data keys, said data keys

occurring at selected times during execution of a program in a central processor,

means for sequentially accepting said memory addresses and providing in response thereto a plurality of sequential legitimate codes,

means for sequentially comparing said legitimate codes with selected portions of said data keys to provide therefrom a signal indicating the validity of said keys, and

means for providing software isolation by specifying areas of memory that may not be altered in response to said sequence of data keys.

4,683,533

STORAGE CONTROL SYSTEM USING PLURAL BUFFER ADDRESS ARRAYS

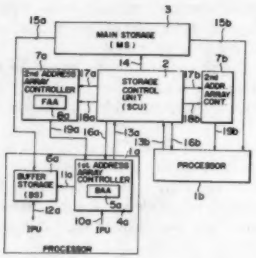
Kenichi Shiozaki, Odawara, and Kanji Kubo, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,771

Claims priority, application Japan, Oct. 27, 1983, 58-202004

Int. Cl.[4] G06F *13/00*; G11C *29/00*

U.S. Cl. 364—200 **2 Claims**



1. A storage control apparatus for a data processing system including a shared storage and a plurality of processors which share said shared storage, at least one of said plurality of processors having a buffer storage for retaining a copy of a part of data stored in said shared storage, said storage control apparatus associated with said at least one processor having the buffer storage, comprising:

a first buffer address array for storing addresses of data stored in said buffer storage and responsive to an access request from said one processor for indicating whether or not a data item exists in said buffer storage;

a second buffer address array for storing the same addresses as those stored in said first buffer address array; and

control means connected to said first and second buffer arrays for updating the content of said second buffer address array and the content of said first buffer address array in response to a first signal indicating a block transfer of data from said shared storage to the buffer storage of said one processor and a second signal indicating a store operation of another processor, said control means including a first address array controller connected to said buffer storage and said first buffer address array for controlling the update of said first buffer address array, and a second address array controller connected to said first address array controller for searching said second buffer address array in response to receipt of said second signal in the form of a store address check request associated with a store operation conducted by said other processor on said shared storage to cancel the store operation address from said second buffer address array and to send a cancellation request to said first address array controller to cancel the store operation address registered in said first buffer address array when the address for said store operation is found in said second buffer address array, said second address array controller including means for replacing an address stored in said second buffer address array with another address in response to said first signal in the form of a replace indication for a block transfer request generated by said one processor and for sending a replace indication to said first address array controller to effect replacement of the same address therein;

wherein said first buffer address array includes means for accepting an access request which has been generated in said one processor on condition that no block transfer to the one processor is in progress and that the content of said first buffer address array associated with any block transfer by said control means has been updated; and

wherein said second address array controller further includes a request stack operating in accordance with a first-in first-out algorithm and connected to said second buffer address array for stacking said store address check request, said replace indication, and said cancellation request generated within said second address array controller in the order of reception thereof and for issuing a refer, cancel or replace indication to said second buffer address array in response to a request issued therefrom; and a cancel/replace stack operating in accordance with the first-in first-out algorithm and connected to said first address array controller for stacking cancellation requests and replace indications in the order of reception thereof and for sending said stacked requests and indications to said first address array controller; whereby said second address array controller, when a store address check request is issued from said request stack, stacks a cancellation request in said cancel/replace stack in association with an indication made by said second buffer address array for the presence of an address associated with said store address search and further stacks a cancellation request in said request stack, and when a replace request is issued from said request stack, stacks a replace indication in said cancel/replace stack.

4,683,534

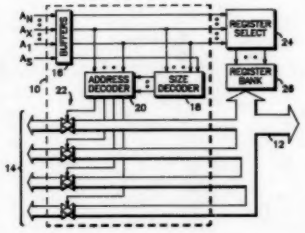
METHOD AND APPARATUS FOR INTERFACING BUSES OF DIFFERENT SIZES

Donald L. Tietjen, and Michael W. Cruess, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1985, Ser. No. 745,477

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 **4 Claims**



1. In a data processing system comprising first and second buses, wherein the second bus is a 2^x sub-multiple of the first bus, x being a predetermined positive integer, a circuit for interfacing the first bus to the second bus, comprising:

a size decoder for receiving as a size control signal the $(x-1)$ least significant bits of a control address and a decoder control signal, the size decoder providing a size select signal indicative of the number y of consecutive least significant bits of the size control signal which are equal to logic one (1);

an address decoder for receiving the x least significant bits of the control address and the size select signal, the address decoder providing 2^2 enable signals indicative of the en-

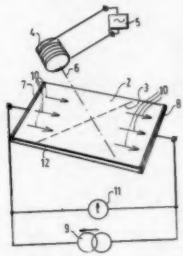
coding of the (x−y) most significant bits of the x control address bits; and

2^x sets of buffers, each set coupling a selected portion of the first bus to a respective portion of the second bus in response to a respective one of the enable signals.

4,683,535
THIN FILM MAGNETOMETER

René M. de Ridder, Hengelo, and Johannes H. J. Fluitman, Enschede, both of Netherlands, assignors to Stichting Centruum Voor Micro Electronika Twente, Enschede, Netherlands

Filed Apr. 2, 1985, Ser. No. 719,067
Int. Cl.⁴ G01R *33/02*
U.S. Cl. 324—249 **11 Claims**

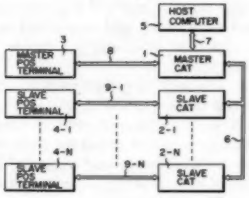


1. A magnetometer comprising the combination of a thin film of ferromagnetic material having an axis of anisotropy lying within the film, means for passing unidirectional electric current along a path lying within said film, means for periodically magnetizing said ferromagnetic material in relatively opposite directions with an alternating magnetic field extending within the film and of sufficient strength to saturate at least a part of the ferromagnetic material through which the current passes, and means for detecting a change in electrical property of that part of the film which is saturated and affected by the presence of an extraneous magnetic field having a component lying within the ferromagnetic material perpendicular to said opposite directions.

4,683,536
PRODUCT SALES DATA PROCESSING SYSTEM FOR ON-LINE CONNECTION TO HOST CPU

Mikio Yamamoto, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,294
Claims priority, application Japan, Aug. 8, 1984, 59-166249
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 364—408 **2 Claims**



1. A product sales data processing system, comprising:

a plurality of point of sales (POS) terminals including a master POS terminal and a number of slaves POS terminals for registering sales data of products by transferring said sales data to an external host computer for registration;

a plurality of slave credit authorization terminals (CATs), each including first card reading means for reading a credit card number from a credit card set at a reading position, a first working memory area, first data input means for inputting sales data of products and a personal identification number into said first working memory area, a slave POS interface arranged for connection to a respective one of said slave POS terminals, a slave CAT interface, and first data transfer control means for controlling data transfer to said slave POS and said slave CAT interfaces; and

a master credit authorization terminal including second card reading means for reading the credit card number from the credit card set at a reading position, a second working memory area, second data input means for inputting sales data of products and a personal identification number, a master POS interface arranged for connection to said master POS terminal, a master CAT interface arranged for connection to the CAT interfaces of said plurality of slave credit authorization terminals, inline circuit means for connecting said master CAT interface to each of said slave CAT interfaces, a host interface arranged for connection to said external host computer, online circuit means for connecting said host interface to said host computer, and second data transfer control means for controlling data transfer to said master POS, master CAT and host interfaces,

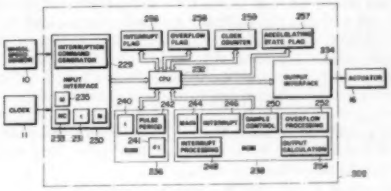
wherein each of said first data transfer control means of said plurality of slave credit authorization terminals produces authorization data on the basis of the sales data from either said respective slave POS terminal or said first data input means, the card data from said first card reading means and the personal identification number from said first data input means, and then supplies said authorization data to said master credit authorization terminal,

the second data transfer control means of said master credit authorization terminal sequentially transferring the authorization data from said plurality of slave credit authorization terminals to the external host computer through said host interface.

4,683,537
ANTI-SKID BRAKE CONTROL SYSTEM FOR AUTOMOTIVE BRAKE SYSTEM WITH QUICK TAKE-UP FEATURE

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 29, 1984, Ser. No. 666,055
Claims priority, application Japan, Nov. 9, 1983, 58-208959
Int. Cl.⁴ B60T *8/32*
U.S. Cl. 364—426 **17 Claims**



1. An anti-skid brake control system for an automotive brake system comprising:

a hydraulic brake system including a wheel cylinder for applying braking pressure to a vehicle wheel, and a pressure control valve associated with said wheel cylinder for adjusting fluid pressure in said wheel cylinder, said pressure control valve being operative to increase fluid pres-

sure in the wheel cylinder in a first position, to subsequently hold increased fluid pressure constant at a second position, to decrease fluid pressure in said wheel cylinder in a third position, and to subsequently hold said decreased fluid pressure constant in a fourth position;

a wheel speed sensor producing a wheel speed indicative signal having a value indicative of the detected wheel speed;

a controller deriving a wheel acceleration on the basis of variation of said wheel speed indicative signal values and selecting first, second, third and fourth operational modes of said pressure control valve on the basis of the detected wheel speed and the derived wheel acceleration to produce a control signal to control said pressure control valve to one of said first, second, third and fourth positions respectively corresponding to the selected operational mode, said controller being responsive to hunting between said first and second operational modes for selecting said first operational mode corresponding to said first position instead of said second operational mode and for maintaining said first position until said third position is selected.

4,683,538

METHOD AND SYSTEM OF CONTROLLING BRAKING ON A WHEELED VEHICLE

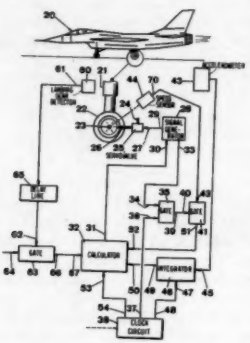
Jean Guichard, La Garenne Colombes, France, assignor to Messier Hispano Bugatti S.A., Montrouge, France

Filed Dec. 10, 1984, Ser. No. 679,718

Claims priority, application France, Dec. 9, 1983, 83 19734

Int. Cl.[4] B60T *8/28, 8/50, 8/60*

U.S. Cl. 364—426 **4 Claims**



1. A method of controlling braking on a wheeled vehicle, at least one wheel having braking means maintainable in selective contact therewith, and means for sensing the speed of said at least one wheel, wherein during a period of application of said brake means, the brake means are actuated so as to slow down the said at least one wheel with respect to a vehicle speed, said brake means being actuated only for sufficient length of time to ensure that the wheel speed is maintained within a predetermined percentage of the vehicle speed, said vehicle speed being calculated in accordance with an initial sensed vehicle speed and a predetermined acceleration value, said method comprising the following steps:

(i) sensing actual vehicle speed by sensing the speed of said at least one wheel, said sensing step being performed for a first predetermined period during which brake means are not applied to said at least one wheel;

(ii) applying said braking means to said at least one wheel for a second predetermined period that is much longer than said first predetermined period, during which said vehicle speed is calculated from sensed vehicle speed and said predetermined acceleration value, wherein said second predetermined period is of sufficient length that said wheel speed is maintained within a predetermined percentage of said estimated vehicle speed; and

(iii) repeating said steps (i) and (ii) until a desired speed of said vehicle is achieved.

4,683,539

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

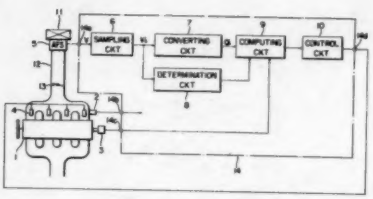
Yoshiaki Kanno, Kakogawa, and Yukinobu Nishimura, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 690,878

Claims priority, application Japan, Jan. 19, 1984, 59-8329

Int. Cl.[4] F02D *5/02;* G01F *1/68*

U.S. Cl. 364—431.05 **9 Claims**



1. A fuel control system for an internal combustion engine comprising:

a rotational speed sensor for determining the rotational speed of said engine and producing a signal representative thereof;

a hot wire type air flow rate sensor for detecting an inlet air flow rate for the engine and producing an output signal corresponding to said inlet air flow rate;

sampling means for receiving the output signal from said sensor at times corresponding to predetermined time intervals or predetermined crank angles and producing sample signals corresponding to said output signal;

converting means for receiving said sample signals, determining values of air flow rate therefrom and producing signals representative of said values of air flow rate;

determination means for determining the gradient of the output of said flow sensor from the sample signals of said sampling means or the output signals of said converting means and producing a signal characteristic thereof, said determination means including means for determining that the gradient of the output of said flow rate sensor has reversed twice from a negative gradient to a positive gradient between predetermined crank angles, the time interval between said two reversals being a time of blow back occurrence except said time interval between said predetermined cranks angles, that portion of said time interval being a time of suction of the engine, said determination means performing said determination only when the output signals of said sampling means are below a predetermined value;

computing means for receiving the signals of said converting means and said determination means and computing an average inlet air flow rate therefrom, said computing means including correction means for computing the inlet air flow rate by addition of said values of air flow rate over the time of suction of the engine to obtain a first sum and addition of said values of air flow rate during the time of blow back occurrences to obtain a second sum, and substracting said second sum from said first sum to obtain the corrected inlet air flow rate and producing a signal representative thereof; and

control means for controlling the fuel supply amount for the

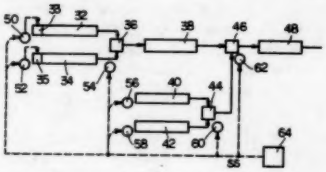
engine on the basis of said corrected inlet air flow rate and rotational speed signals.

4,683,540

METHOD AND APPARATUS FOR ORDERING A WORKING OPERATION IN AN ASSEMBLY LINE

Noriaki Kurosu, Aichi; Masanori Ohmae, and Michiaki Kashiwa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 30, 1984, Ser. No. 645,759
Claims priority, application Japan, Sep. 9, 1983, 58-167291
Int. Cl.⁴ G06F *15/46, 15/226;* B65G *43/00;* B07C *5/00*
U.S. Cl. 364—468 **5 Claims**



5. A method for controlling a vehicle assembling system, comprising the steps of:

outputting signals from a computer means, said signals including sub-serial numbers, main-serial numbers and model numbers, at least one of the main-serial numbers corresponding to one of the sub-serial numbers and one of the model numbers;

indicating a first main-serial number and a first model number on a first indicator means in accordance with said signals received from said output of said computer means;

indicating a second main-serial number and a second model number on a second indicator means in accordance with receipt of the signals from the computer means;

numbering one part of a first sub-assembly of a first model with the main-serial number indicated on the first indicator means and the corresponding sub-serial number;

numbering one part of a first sub-assembly of a second model with the main-serial number indicated on the second indicator means and the corresponding sub-serial number;

provisionally assembling said first sub-assembly of said first model, said first sub-assembly comprising a plurality of parts;

provisionally assembling said first sub-assembly of said second model, said first sub-assembly comprising a plurality of parts;

indicating a third main-serial number and a third model number on a third indicator means in accordance with receipt of said signals from the computer means;

selecting one of the first assemblies of the first or second models from the first and second sub-assembly lines in accordance with the model number indicated on the third indicating means; and

finally assembling the selected first sub assembly of the first model or the second model.

4,683,541

ROTARY FLUIDIZED BED COMBUSTION SYSTEM

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Mar. 13, 1985, Ser. No. 711,287
Int. Cl.⁴ G06F *15/20;* F23G *5/00*
U.S. Cl. 364—500 **14 Claims**

1. A method for burning fuel in the form of solid particles in a rotary fluidized bed combustion system comprising the steps of:

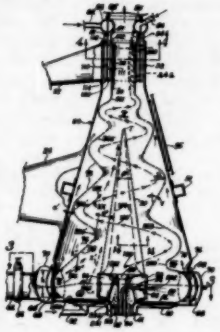
introducing solid fuel in particulate form;

introducing air for burning said fuel;

enclosing by and containing within walls the mixture of air and fuel thus introduced in a combustion region where fuel and air chemically interact (burning process) in a fluidized bed generated by the manner in which the air and the fuel are introduced in the combustion region;

generating an artificial gravity field substantially stronger than the earth gravitational field, said artificial gravity field being created by rotating the air/fuel mixture around an axis substantially orthogonal to the general direction followed by the combusted gases on their way out of the combustion region;

preventing the fuel particles from contacting the walls surrounding the fuel burning process by means of balancing the centrifugal forces acting on the particles and caused by the artificially created gravity field against the oppos-



ing aerodynamic forces also acting on the particles and which are caused by the means for introducing some of the air for burning the fuel;

segregating the fuel burning along the path followed by the particles as they burn and proceed toward the combustion system exhaust, and away from the walls around said combustion region;

elongating the pathway generally followed by the particles during the burning process, thereby increasing their residence time in the combustion region until their burning is generally completed before the particles leave the combustion system; and

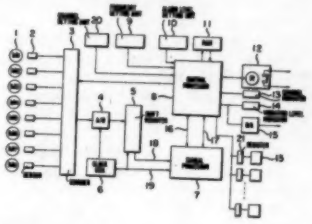
exhausting the combusted gases.

4,683,542

VIBRATION MONITORING APPARATUS

Ryousuke Taniguti, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP84/00355, § 371 Date Feb. 7, 1985, § 102(e) Date Feb. 7, 1985
PCT Filed Jul. 11, 1984, Ser. No. 702,411
Claims priority, application Japan, Jul. 15, 1983, 58-130018
Int. Cl.⁴ G01H *11/06;* G01M *13/00;* G06F *15/36*
U.S. Cl. 364—508 **6 Claims**



1. A vibration monitoring apparatus for monitoring vibrat-

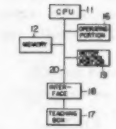
ing conditions of a plurality of rotary machines comprising a rotational frequency setting unit for setting rotational frequencies of respective rotary machines, an alarm level setting unit for setting alarm vibration level values of corresponding rotary machines, a nonvolatile memory for storing set values provided by said rotational frequency setting unit and said alarm level setting unit, a vibration sensor receiving oscillation signals generated by the rotary machines to detect vibrations thereof, signal processing means operated under program control for determining vibration amplitude values corresponding to the vibrations of respective rotary machines, a control processor supplying the set values provided by said rotational frequency setting unit and said alarm level setting unit to said processing means, said processing means including means for comparing the alarm vibration level values set for the respective rotary machines and for generating an output each time one of the vibration amplitude values is greater than one of the alarm vibration level values of the corresponding rotary machine, said control processor including means responsive to the output generated by said processing means for generating alarm and indicating signals corresponding to the output from said processing means, and output means receiving the alarm and indicating signals from said control processor and indicating vibrating conditions of said rotary machines.

4,683,543

TIME-BASED INTERPOLATION CONTROL OF A ROBOT

Kazushige Hirasawa, Kawanishi; Yasuhiro Shimizu, Nara, and Takemasa Matsumura, Minoo, all of Japan, assignors to Matsushita Electrical Industrial Co. Ltd., Osaka, Japan

Filed Jul. 11, 1984, Ser. No. 629,623
Claims priority, application Japan, Jul. 14, 1983, 58-128607
Int. Cl.[4] G05B *19/41*
U.S. Cl. 364—513 **4 Claims**



1. A method of interpolatively controlling the movement of an arm portion of a robot along a locus between predetermined first and second spatial positions, said arm being movable at predetermined velocities, comprising

(1) teaching steps including

(a) inputting and storing in a teaching data storing memory the values of coordinates defining said first and second spatial positions;

(b) inputting and storing in said teaching data storing memory the predetermined velocity of said arm at said first spatial position;

(c) determining from the coordinates stored in said memory in step (1)(a) the distance to be traversed by said arm between said first and second spatial positions, said distance being stored in said memory; and

(d) determining from the predetermined velocity stored in step (1)(b) and the distance stored in step (1)(c) the traversal time required for said arm to move from said first spatial position to said second spatial position, said traversal time being stored in said memory; and

(2) playback steps for calculating in a locus calculating processing unit interpolated distances through which the arm portion of said robot is to be moved based on the teaching data stored in said memory in step (1), said playback steps including

(a) dividing the traversal time obtained in step (1)(d) by a predetermined unit time to obtain a plurality of time-separated interpolation points, said time-separated interpolation points corresponding to distance-separated points along said locus having a unit distance therebetween; and

(b) calculating sequentially incremental coordinate values for each of said distance-separated points from the stored coordinate values obtained in step (1)(a); and

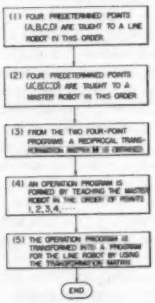
(3) moving the arm portion of said robot in accordance with the incremental coordinate values calculated in step (2)(b).

4,683,544

METHOD OF TEACHING AN OPERATION PROGRAM TO A LINE ROBOT WHEREIN A MASTER ROBOT POSITIONED AT A LOCATION REMOTE FROM SAID LINE ROBOT IS FIRST TAUGHT THE PROGRAM

Kazuo Hariki, Toyama, Japan, assignor to Kabushiki Kaisha Fujikoshi, Toyama, Japan

Filed Oct. 2, 1984, Ser. No. 657,381
Claims priority, application Japan, Nov. 16, 1983, 58-214085
Int. Cl.[4] G05B *13/00*
U.S. Cl. 364—513 **1 Claim**


(1) FOUR PREDETERMINED POINTS (A,B,C,D) ARE TAUGHT TO A LINE ROBOT IN THIS ORDER
(2) FOUR PREDETERMINED POINTS (A',B',C',D') ARE TAUGHT TO A MASTER ROBOT IN THIS ORDER
(3) FROM THE TWO FOUR-POINT PROGRAMS A RECIPROCAL TRANSFORMATION MATRIX M IS OBTAINED
(4) AN OPERATION PROGRAM IS FORMED BY TEACHING THE MASTER ROBOT IN THE ORDER OF POINTS 1, 2, 3, 4, ...
(5) THE OPERATION PROGRAM IS TRANSFORMED INTO A PROGRAM FOR THE LINE ROBOT BY USING THE TRANSFORMATION MATRIX
END

1. An off-line teaching method for industrial robots including at least a line robot placed in an operating line for processing a line work arranged therein, said method comprising the steps of:

preparing, in addition to the line robot and the line work, a master disposed in a location remote from the operating line and a model work similar to the line work positioned adjacent said master robot;

selecting a first four reference points on said model work and a second corresponding four reference points on said line work, said first and second four reference points being located in different planes;

teaching said master robot said first four reference points at said location remote from the operating line;

teaching said line robot said second four reference points in the same order as said teaching of the first four reference points to the master robot;

obtaining a transformation matrix from the first four reference points taught to said master robot and the second four reference points taught to said line robot, said transformation matrix being obtained by solving a system of twelve linear equation with twelve unknowns, said linear equations being established by the first four reference

points taught to said master robot and the second four reference points taught to said line robot;

teaching said master robot an operation program by using said model work in said location remote from said operating line; and

transforming the operation program taught to said master robot into an operation program for said line robot by using said transformation matrix to thereby teach the operation program to said line robot.

4,683,545

SPEED DETERMINING PROCESS AND A DEVICE FOR IMPLEMENTING SAME

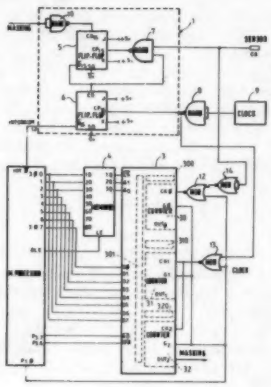
Jean-Pierre Fauvet, Rueil Malmaison, and Jacques Parisel, Maisons Lafitte, both of France, assignors to La Telemecanique Electrique, France

Filed Aug. 20, 1984, Ser. No. 642,326

Claims priority, application France, Aug. 30, 1983, 83 13869

Int. Cl.[4] G01P *3/48, 3/54, 3/56;* **G01R** *23/02*

U.S. Cl. 364—565 **4 Claims**



1. Device for determining the speed of a member carrying a sensor producing first pulses whose frequency is proportional to the speed, said device comprising:

a time measuring clock which produces second pulses;

a microprocessor having at least an interruption input, an address/data BUS and an input/output port;

a programmable counting circuit connected to said address-/data BUS and including a first counter for downcounting a first preselected value at the timing of the pulses generated by said sensor, a second counter for downcounting a second preselected value at the timing of said time measuring clock and a third counter for downcounting in a downcounting step a third preselected value at the timing of said time measurement clock, said third counter having a masking output which produces a masking signal during said downcounting step;

means for applying on said interruption input interruption signals in synchronism and generated in accordance with said first and second pulses;

means for periodically masking said interruption signals following a predetermined wave front of the clock signal successing to the emission of said masking signal,

said microprocessor having means for reading and for storing in a memory of the contents of said first and second counters through at least a read out register during an interruption which follows the end of said masking signal, means for reloading of said first, second and third counters respectively to said first, second and third preselected values after said reading, means for calculating the speed by determining the quotient of the contents of said first and said second counters stored in said memory

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4,683,546

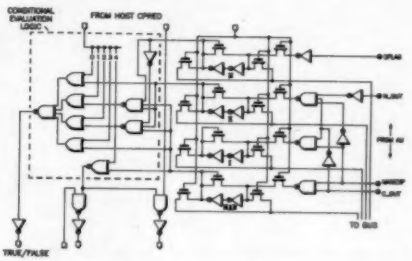
FLOATING POINT CONDITION CODE GENERATION

Joel F. Boney, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 787,025, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 567,830, Jan. 3, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 918,682

Int. Cl.[4] G06F *7/48*

U.S. Cl. 364—748 **20 Claims**



1. A method comprising the steps of:

performing an arithmetic operation on two floating point operands to produce a floating point result;

generating a first set of condition codes comprising:

Zero (Z) if the result is a floating point zero;

Negative (N) if the result is negative;

Not a Number (NaN) if the result is not a floating point number; and

Infinity (I) if the result is a floating point

logically combining the first set of condition codes to produce a second set of condition codes comprising:

Equal (EQ) if the result is equal to zero;

Greater Than (GT) if the result is greater than zero;

Less Than (LT) if the rsult is less than zero; and

Unordered (UN) if the result is not a floating point number.

4,683,547

SPECIAL ACCUMULATE INSTRUCTION FOR MULTIPLE FLOATING POINT ARITHMETIC UNITS WHICH USE A PUTAWAY BUS TO ENHANCE PERFORMANCE

Richard D. DeGroot, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1984, Ser. No. 664,739

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—748 **9 Claims**

4. In an arithmetic unit for performing vector and matrix related arithmetic operations for producing two arithmetic results per cycle of operation, one of which is the result of an accumulate type operation, the combination:

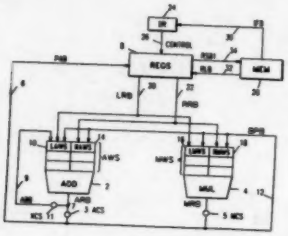
an adder having first and second inputs and an output, including a first switch connected to said output, with said first switch being on when an add type operation is being completed, with said first switch being off at all other times;

a multiplier having first and second inputs and an output, including a second switch connected to said output, with said second switch being on when a multiply type operation is being completed, with said second switch being off at all other times;

an accumulator bypass bus connected to said first input of said adder, including a third switch connected to said

accumulator bypass bus and connected to said output of said adder, with said third switch being on when an accumulate type operation is being completed, with said third switch being off at all other times, and with said second and third switches being permitted to be concurrently on such that two arithmetic results may be concurrently produced, one of which is the result of an accumulate type operation;

a putaway bus connected to said first and second switches for receiving the results of an adder type or multiplier type operation, dependent upon whether or not said first or second switch is on;



a bypass bus connected to said first and second switches and to the first and second inputs of each of said adder and multiplier for receiving the results of an adder type or multiplier type operation, dependent upon whether or not said first or second switch is on; and

a register file having an input connected to said putaway bus for receiving the results of an adder type or multiplier type operation dependent upon whether or not said first or second switch is on, with said register file having a first output connected to the respective first inputs of said adder and multiplier, and said register file having a second output connected to the respective second inputs of said adder and mutliplier.

4,683,548

BINARY MOS RIPPLE-CARRY PARALLEL ADDER/SUBTRACTER AND ADDER/SUBTRACTER STAGE SUITABLE THEREFOR

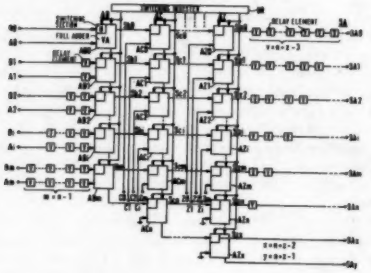
Daniel Mlynek, Wolfgantzen, France, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 311,377, Oct. 14, 1981, abandoned. This application Sep. 24, 1985, Ser. No. 780,226

Claims priority, application European Pat. Off., Nov. 3, 1980, 80106726.5

Int. Cl.[4] G06F *7/50*

U.S. Cl. 364—786 **19 Claims**



1. A parallel adder/subtracter employing enhancement-mode insulated-gate field-effect transistors for combining a plurality of numbers each represented by a plurality of parallel bits, comprising:

a plurality of binary ripple-carry parallel adders/subtracters, each operating on a pair of digital words coupled thereto, each of said adders/subtracters forming partial sum outputs, each of said plurality of adders/subtracters including a plurality of adder/subtracter stages the partial sum outputs from each stage coupled to the succeeding stage, each said stage being responsive to a different bit of an associated one of said pairs of digital words;

each of said stages comprises a full adder, said full adder having a first input receiving a bit of a first one of said pair of digital words and having a second input; and switching section means having a first input receiving a bit of the second one of said pair of digital words and having an output coupled to said full adder second input, said switching section means being selectively operable to invert or not invert said bit of the second one of said pair of digital words in response to switching signals;

an input delay means for coupling said two numbers to said first one of said adder/subtracters such that each bit of a first of said two numbers and each bit of a second of said numbers is delayed by one predetermined time period greater than the preceding lower order bit of said first number and the preceding lower order bit of said second number, respectively;

a plurality of sum output terminals; and

an output delay means for coupling the outputs of a last one of said plurality of adder/subtracters to said plurality of sum output terminals such that each output bit of said last adder/subtracter is delayed by one predetermined time period greater than the succeeding higher order output bit.

4,683,549

SEQUENCE CONTROL METHOD AND APPARATUS

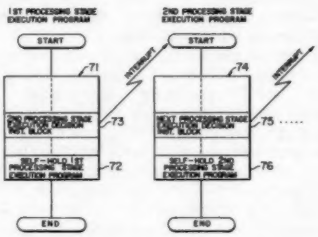
Masaoki Takaki, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Control Systems, Inc., Ibaraki, both of, Japan

Filed May 7, 1984, Ser. No. 607,652

Claims priority, application Japan, May 7, 1983, 58-79895

Int. Cl.[4] G06F *9/00, 15/00*

U.S. Cl. 364—900 **14 Claims**



1. A sequence control apparatus comprising:

means for storing a plurality of divisional programs divided from a sequence program for sequence-controlling a system under control, each of said divisional programs corresponding to a respective one of a plurality of processing stage units of a sequence process for the system;

means for storing a main program including a plurality of instruction blocks, each instruction block corresponding to a respective one of the divisional programs and including a decision step of whether the corresponding divisional program is to be executed or not in accordance with information read from the system under control;

an address table containing information indicating the correspondence between said divisional program and their top addresses;

a first processor connected to said main program storing means and including a program counter for cyclically executing said main program while updating the content of the program counter and reading out the information from the system under control, and for interrupting the execution of said main program to produce a control signal including identification information for identifying the divisional program corresponding to the instruction block being executed when it is determined during the execution of the corresponding instruction block that said divisional program is to be executed; and

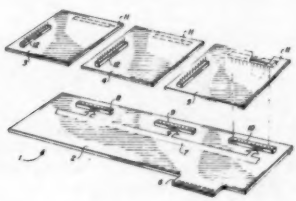
a second processor connected to said address table and said first processor and responsive to said control signal for retrieving from said address table the top address of the divisional program for the instruction block in which said control signal was produced, based on the identification information of said control signal, and for setting the retrieved top address into said program counter of said first processor.

4,683,550

PERSONAL COMPUTER INSTRUMENTATION SYSTEM INCLUDING CARRIER BOARD HAVING BUS-ORIENTED PLUG-IN INSTRUMENTATION MODULES

James A. Jindrick; Shashikant M. Patil; Margaret S. Morrison, and Littleton D. Page, all of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jul. 30, 1984, Ser. No. 634,999
Int. Cl.[4] G06F 9/02
U.S. Cl. 364—900 **36 Claims**



1. An instrumentation system, for connection to a connector of a digital bus of a host computer, comprising in combination:

(a) a carrier module having a host computer digital bus connector for mating with said digital bus connector;

(b) an instrumentation bus disposed on said carrier module, said instrumentation bus including a digital portion and a segmented analog portion;

(c) a plurality of instrument module connectors electrically connected to said instrumentation bus, said digital portion of said instrumentation bus including a plurality of conductors each coupled to a corresponding terminal conductor of a respective one of said instrument module connectors, each segment of said segmented analog portion of said instrumentation bus including an analog bus segment connector connected to a respective input terminal conductor of one of said instrument module connectors and a respective output terminal conductor of another one of said instrument module connectors;

(d) interface circuit means coupled to said host computer digital bus connector and to said digital portion of said instrumentation bus for reconfiguring and/or reformatting digital data received from one of said digital bus of said host computer on said digital portion of said instrumentation bus and outputting the reconfigured and/or reformatted digital data to the other of said digital bus of said host computer and said digital portion of said instrumentation bus; and

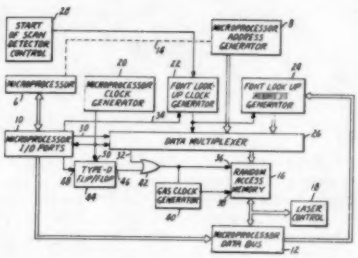
(e) a plurality of instrument module means, each plugged into a respective one of said instrument module connectors, for receiving an analog signal from a conductor of one segment of said segmented analog bus portion, and transmitting a modified version of that analog signal to another conductor of another segment of said segmented analog portion, each instrument means including means for operating on its received analog signal to produce the modified version.

4,683,551

RAM CLOCK SWITCHING CIRCUITRY FOR A LASER BEAM PRINTER

David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1984, Ser. No. 594,211
Int. Cl.[4] G06F 13/00
U.S. Cl. 364—900 **2 Claims**



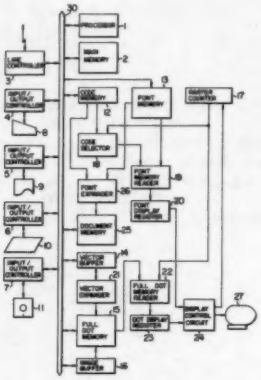
1. An improved microprocessor controlled laser printer that includes a microprocessor; memory for storage of microprocessor information plus memory for storage of font information for laser output control; a microprocessor clock generator having an output providing clock signals for use in accessing the microprocessor information; and a font look-up clock generator having an output providing clock signals for use in accessing the font information; wherein the improvement includes a single random access memory (RAM) providing the memory for storage of the microprocessor information plus the font information; the microprocessor having a first output at which control signals are provided and a second output at which lockout request signals are provided; and a clock switching circuitry for said RAM having a switch means connected to the output of the microprocessor and font look-up clock generators and to said first output of the microprocessor, said switching means having an output at which the clock signals of the microprocessor and font look-up clock generators are alternately provided in response to said control signals from said first output of the microprocessor and said clock switching circuitry further including a lockout switch portion having one input connected to said output of said switch means and a second input connected to said second output of the microprocessor for receiving lockout request signals, said lockout switch portion having an output connected to said RAM, said lockout switch portion producing a lockout signal in response to a lockout request signal which prevents passage to said output of said lockout switch portion of clock signals presented at said output of said switch means, said lockout switch portion having a third input connected to the output of the microprocessor clock generator for receiving clock signals for timing operation of the lockout switch portion for the initiation and termination of a lockout signal relative to the start and end of a lockout request signal.

4,683,552

SYSTEM FOR ON-LINE AND OFF-LINE DISPLAY

Hiroaki Kambayashi, and Yasuyuki Okada, both of Sagamihara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,825
Claims priority, application Japan, Apr. 27, 1983, 58-72861
Int. Cl.[4] G06F 3/023
U.S. Cl. 364—900 **2 Claims**



2. A display system operated in an on-line mode when connected with a host computer and in an off-line mode when disconnected from said host computer for displaying character data having a first display data form under control of processing means in a display device for on-line mode operation and for displaying character data having a second display data form under control of said processing means on said display device for off-line operation mode, wherein said first and second display data forms are different from each other, comprising:

first storage means for storing character codes;

second storage means for storing dot patterns for each of said character codes,;

first means coupled to sald first storage means and said second storage means for reading out in the on-line mode from said second storage means dot pattern data corresponding to the character codes read out from said first storage means;

second means coupled to said first means and said display device for converting said dot pattern data read out from said second storage means during said on-line mode into video signals so that said dot pattern data is displayed on said display device in said first display data form;

third storage means coupled to said first storage means for storing character codes read out from said first storage means under control of said processing means;

fourth storage means for storing dot patterns in said second display data form;

data transforming means coupled to said second storage means, said third storage means, and said fourth storage means for reading out in the off-line mode from said second storage means dot patterns on a character-by-character basis corresponding to the character codes stored in said third storage means, for converting said dot patterns to said second display data form, and for storing the same in said fourth storage means in the second display data form; and

third means coupled to said fourth storage means and said second means for sending the dot patterns to said second means so that said dot patterns are displayed on said display device in said second display data form during said off-line mode of operation;

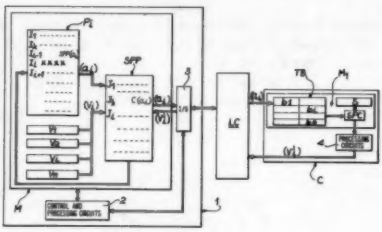
said processing means operation to control said first storage means so that the storing of character codes in said third storage means by said processing means and the dot pattern displaying operation by said first means and said second means are carried out simultaneously with each other for the same character code stored in said first storage means during said in-line mode of operation.

4,683,553

METHOD AND DEVICE FOR PROTECTING SOFTWARE DELIVERED TO A USER BY A SUPPLIER

Jean Mollier, Bougival, France, assignor to Cii Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 698,261, Feb. 5, 1985, abandoned, which is a continuation of Ser. No. 476,494, Mar. 18, 1983, abandoned. This application Feb. 5, 1986, Ser. No. 828,080
Claims priority, application France, Mar. 18, 1982, 82 04612
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—4 **8 Claims**



1. A system for protecting software programs ($P_1 \ldots P_b \ldots P_n$) adapted to be executed on a data processing machine (1) of a user of the software programs, said machine having at least one memory (M), control and processing circuits (2), and an input/output device (3), the system comprising:

a card (C), specific to the user, possessing at least one memory (M1) and processing circuits (4), and

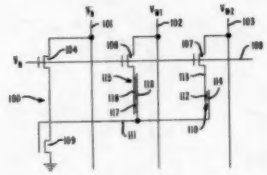
a card reader (LC) coupled with the input/output device (3) of the machine (1) and with the card (C) to enable data transfer therebetween; the memory (M) of the machine (1) containing at least one program (P_i) delivered by a supplier of the software programs, the one program including an identification parameter (a_i) which identifies the one program and having a scrambled portion which renders the one program non-executable on the machine, containing a main validation key code (V_i), specific to the one program, issued by the supplier, and containing a master program (SPP); the memory (M1) of the card (C) containing at least one secret code (S) specific to the user and known only to the suppler, and identification arguments which identify the programs, at least one of said identification arguments (b_i) identifying said one program, the card having means responsive to the identification parameter (a_i) contained in the one program (P_i) for addressing said identification argument (b_i), and the processing circuits (4) of the card having means for computing a supplementary validation key code (V'_i) from the secret code (S) and the addressed identification argument (b_i) of the program (P_i) and for transferring the supplementary validation key code to the machine; and wherein the master program (SPP) is formed to combine the supplementary validation key code (V'_i) and the main validation key code (V_i) for unscrambling the scrambled portion of the program (P_i) and rendering the program executable.

4,683,554

DIRECT WRITE NONVOLATILE MEMORY CELLS

George C. Lockwood, Dayton; James A. Topich, Centerville; Raymond A. Turi, Miamisburg, and George H. Maggard, Xenia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 13, 1985, Ser. No. 775,980
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 9 Claims



1. A floating gate type nonvolatile memory cell formed in a semiconductor substrate, comprising:

a floating gate electrode having four defined regions over the semiconductor substrate;

a first conductively doped region in the substrate, situated beneath the first region of the floating gate electrode and separated therefrom by a first dielectric material layer to form thereby a coupling of first capacitance;

a second conductively doped region in the substrate, situated beneath the second region of the floating gate electrode and separated therefrom by a second dielectric material layer to form a coupling of second capacitance, materially less than the first capacitance, and defined a region of charge transfer through the second dielectric material layer;

third and fourth conductively doped regions in the substrate which are electrically isolated from the first and second conductively doped regions, defining therebetween a channel situated beneath the third region of the floating gate electrode and separate therefrom by a third dielectric material layer, to form a field effect transistor responsive to the charge resident on the floating gate electrode;

access means for selectively connecting the third conductively doped region in the substrate to a bit line, selectively connecting the first conductively doped region in the substrate to a first write line, and selectively connecting the second conductively doped region in the substrate to a second write line; and

means for selectively applying potentials of first relative polarity between the first and second write lines suitable to cause a transfer of charge in one direction through the second dielectric material layer, or of a second relative polarity between the first and second write lines to cause a transfer of charge in the opposite direction through the second dielectric material layer.

4,683,555

SERIAL ACCESSED SEMICONDUCTOR MEMORY WITH RECONFIGUREABLE SHIFT REGISTERS

Raymond Pinkham, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 22, 1985, Ser. No. 693,498
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—215 11 Claims

1. A semiconductor memory for storing pixel information for a video display, comprising;

a first memory array having a plurality of memory elements arranged in rows and columns and associated with a predetermined pixel locations in the display;

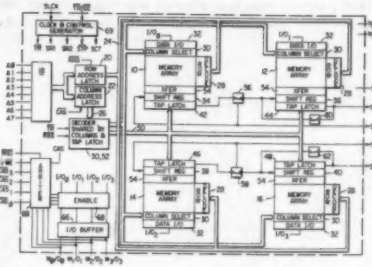
a second memory array having a plurality of memory elements arranged in rows and columns and associated with predetermined pixel locations on the display said first and second memory arrays being identical;

row decode means for receiving a row address and selecting one of the rows of memory elements in both said first and second memory arrays;

first serial access means for storing data from the selected memory elements of said first memory array in a serial format;

said second serial access means for storing data from selected memory elements of said second memory array in a serial format;

said first and second serial access means having a separate



serial input and a separate serial output and controlled from an external source to serially shift data therethrough;

transfer means for transferring data from the selected memory elements at said first and second array to the respective one of said first and second serial access means or from said serial access means to the selected memory elements in said first and second array; and

means for configuring said first and second access means to each circulate data from the serial output to serial input thereof or to cascade said first and second serial access means with the serial output of said first serial access means connected to the serial input of said second serial access means.

4,683,556

METHOD FOR IDENTIFYING ARRIVAL TIMES OF WAVEFORMS ON ACOUSTIC BOREHOLE WELL LOGS

Mark E. Willis, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,531
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—27 6 Claims

1. A method for identifying the arrival times of waveforms on an acoustic borehole well log obtained by running a borehole logging tool having at least one acoustic transmitter and at least one acoustic receiver through a borehole and activating said transmitter at a plurality of spaced-apart depth points within the borehole so that an acoustic trace is obtained of the transmission of acoustic energy from the transmitter to the receiver through the earth formations surrounding the borehole at each of said plurality of depth points, comprising the steps of:

(a) selecting a plurality of at least three successive depth point acoustic traces from a single transmitter-receiver pair,

(b) measuring the arrival time of the acoustic wave on the center trace of said plurality of traces from visual observation,

(c) placing a first window about the arrival time of the acoustic signal along the trace of the center trace of said selected plurality of successive traces,

(d) positioning said first window across each of the remain-

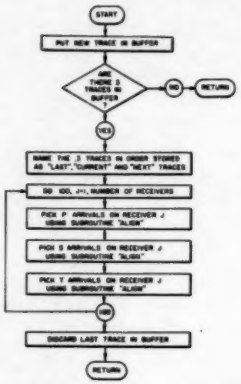
ing plurality of successive traces with a linear moveout function between the traces,

(e) performing a first n-fold correlation on those portions of said plurality of successive traces which lie within said first window positions across said traces,

(f) incrementally pivoting said first window about its fixed position on said center trace thereby repositioning said first window in accordance with the linear moveout function across each of the remaining plurality of successive traces,

(g) performing additional n-fold correlations on the portions of said plurality of successive traces which lie within each of the incrementally pivoted first window positions,

(h) identifying a trend for the arrival times of the acoustic wave across said plurality of successive traces based on the n-fold correlation yielding the best signal coherence


START
PUT NEW TRACE IN BUFFER
ARE THERE 3 TRACES IN BUFFER ?
NO
RETURN
YES
NAME THE 3 TRACES IN ORDER STORED AS "LAST", "CURRENT" AND "NEXT" TRACES
DO 100, J=1, NUMBER OF RECEIVERS
PICK P ARRIVALS ON RECEIVER J USING SUBROUTINE "ALIGN"
PICK S ARRIVALS ON RECEIVER J USING SUBROUTINE "ALIGN"
PICK T ARRIVALS ON RECEIVER J USING SUBROUTINE "ALIGN"
100
DISCARD LAST TRACE IN BUFFER
RETURN

among the incremental first window positions across said plurality of successive traces,

(i) employing said trend to position a second window across said center trace and the next successive trace in depth within the borehole,

(j) performing a two-fold correlation on those portions of said center trace and said next successive depth trace which lie within said second window,

(k) identifying the arrival time of the acoustic wave on said next successive depth trace with respect to the measured arrival time of the acoustic wave on the center trace based on the correlation yielding the best signal coherence between said center trace and said next successive depth trace within said second window, and

(l) repeating steps (c) through (k) for each sequential grouping of said plurality of successive traces along said borehole.

4,683,557

ACOUSTIC LOGGING METHOD FOR IDENTIFYING SUBSURFACE FORMATION BOUNDARIES

Mark E. Willis, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

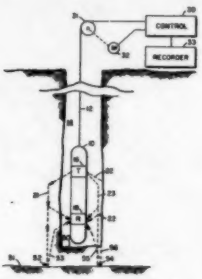
Filed Oct. 5, 1984, Ser. No. 657,906
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—57 **13 Claims**

1. A method for identifying a subsurface formation boundary below a borehole comprising the steps of:

(a) generating acoustic energy at a first position along said borehole,

(b) receiving acoustic energy at a second spaced apart position below said acoustic energy generating position and near the bottom of said borehole,

(c) recording like acoustic waveforms which have traveled to said receiving position from said generating position (i) directly along a first path through borehole of the formation immediately adjacent the borehole, and (ii) indirectly along a second path that coincides with and extends said first path through the subsurface formation directly below said borehole by way of reflection from a subsurface formation boundary directly below the bottom of said borehole,



(d) determining the difference in travel times of said recorded like acoustic waveforms, and

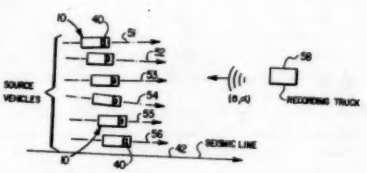
(e) determining the depth of said subsurface formation boundary below said borehole from said travel time difference and the velocity of acoustic energy through said formation.

4,683,558

CONTROL SYSTEM FOR INCLINED IMPACT-TYPE SURFACE SEISMIC SOURCE

Gary M. Karner, Allen, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 8, 1986, Ser. No. 860,966
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—189 **10 Claims**



1. A system for controlling the azimuths and inclinations of the respective shooting paths of a plurality of separate vehicle-transported surface seismic sources, each said source having an impact mass, means for propelling said mass along said shooting path to strike an earth contacting base plate, and means for adjusting each said shooting path by rotation thereof about two mutually perpendicular gimbal axes oriented in predetermined relation to the heading of the associated vehicle, said system comprising:

(a) means for determining each such vehicle heading:

(b) means dependent upon each said vehicle heading for calculating the angular positions of each said shooting path with respect to said gimbal axes which align said shooting path with desired values of azimuth and inclination; and

(c) means responsive to said calculation means for actuating each said shooting path adjustment means to effect such alignment.

4,683,559
OPTICAL PICKUP WITH A TWO-DETECTOR ARRANGEMENT

Masami Emoto; Hiroshi Gotoh, and Hideo Inuzuka, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 602,189
Claims priority, application Japan, Apr. 20, 1983, 58-68445; Aug. 10, 1983, 58-144870; Sep. 20, 1983, 58-172087
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—44 **10 Claims**

1. An optical pickup for detecting the position of a subject in a first direction and a second direction, comprising:

a light source;

an optical system for directing a light beam emitted from said light source onto said subject and for collecting a reflected light beam for said subject;

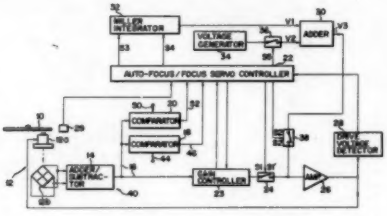
first detecting means for detecting the position of said subject in a first direction by receiving a first part of said reflected light beam; and

second detecting means for detecting the position of said subject in a second direction which is different from said first direction by receiving a second part of said reflected light beam, said first part being larger in amount than said second part.

4,683,560
MICROPROCESSOR CONTROLLED FOCUSSING SERVO ACQUISITION

Toyoaki Takeuchi; Ken Ohshima; Hideyuki Kenjyo; Yoshiaki Ikeda, and Masaharu Sakamoto, all of Tokyo, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,631
Claims priority, application Japan, Dec. 23, 1982, 57-232035
Int. Cl.[4] G11B 7/095
U.S. Cl. 369—45 **10 Claims**



1. An auto-focusing system, comprising:

(a) light radiator means for radiating a light beam so as to form a light spot on an information plane of a rotating optical type information record carrier body, said light radiator means being controllably movable along a line substantially perpendicular to said information plane;

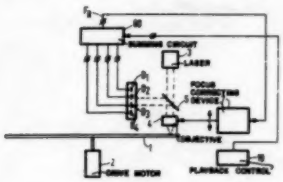
(b) focus servo means for moving said light radiator means along said line so that the distance between said light radiator means and said information plane is within a designated distance interval to thereby satisfactorily focus the light spot on said information plane, said designated distance interval being defined between a too-far position as the point most distant from said record carrier body within said designated distance interval and a too-near position as the point closest to said record carrier body within said designated distance interval; and

(c) controller means for inhibiting said focus servo means when the light radiator means approaches said record carrier body from a distance beyond the too-far position, for temporarily stopping the movement of said light radiator means when the light radiator means reaches said too-far position, and for causing said light radiator means to further approach said carrier body from said too-far position by only a predetermined distance so as to be located in a second position, thereby locating said light radiator means within said designated distance interval to prevent an approach of the light radiator means which results in its colliding with said record carrier body.

4,683,561
SMOOTH LOCK-IN OF SERVO CONTROL WHEN SWITCHED ON

Martinus P. M. Bierhoff, and Hubertus M. M. Lonij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1985, Ser. No. 774,418
Claims priority, application Netherlands, May 28, 1985, 8501509
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—45 **5 Claims**



1. In an apparatus of the kind for projecting a light beam onto an optically readable record carrier and detecting the light beam reflected therefrom and having at least two subdetectors for detecting the light beam which has been reflected from the record carrier, a focussing device for focussing the light beam on the record carrier, generating circuit means for generating a focussing error signal which comprises a first signal corresponding to the difference between two signals supplied by the subdetectors, and a focussing correction device for adjusting the focussing device in response to the focussing error signal, the improvement wherein said generating circuit means initially generates as the focussing error signal a second signal corresponding to the sum of the signals supplied by the subdetectors minus a first threshold signal and subsequently gradually changes over said focussing error signal from said second signal to said first signal.

4,683,562
OPTICAL INFORMATION RECORDING DISK

Fumio Matsui, and Yasushi Murata, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

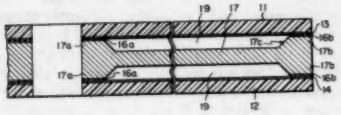
Filed Aug. 19, 1985, Ser. No. 767,021
Claims priority, application Japan, Aug. 23, 1984, 59-127779[U]
Int. Cl.[4] G11B 7/24
U.S. Cl. 369—284 **1 Claim**

1. An optical information recording disk comprising:

a reinforcement disk having a center bore and provided with annular spacers on the both main surfaces thereof at the inner and outer peripheral side portions of the main surfaces thereof, the annular spacers and the reinforcement disk being integrated with each other and made of the same material, and

a pair of disk-shaped substrates each having a center bore

and respectively adhered onto said annular spacers so as to respectively face the main surfaces of said reinforcement disk in such a manner that the center bores of said reinforcement disk and said disk-shaped substrates are aligned to each other, at least one of said disk-shaped substrates carrying an information bearing layer on the



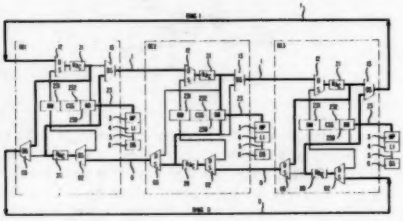
inner surface thereof, in which said reinforcement disk having the outer cylindrical surface thereof exposed to the outside in the radial direction, which is characterized in that the inner surface of each of said annular spacers is so inclined as to form an obtuse angle together with the main surface of said reinforcement disk.

4,683,563

DATA COMMUNICATION NETWORK

David M. Rouse, Columbus; Richard E. Wallace, Newark, and Charles M. Zelms, Worthington, all of Ohio, assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 11, 1984, Ser. No. 660,015
Int. Cl.[4] H04J *1/16*
U.S. Cl. 370—16 **25 Claims**



1. A method for maintaining a data communication network having ring transmission paths interconnected by nodes each coupled with a node processor and data systems comprising the steps of

isolating failing segments of the data communication network by enabling ones of the nodes to loop connect ones of the ring transmission paths together, and

communicating with ones of the nodes located in said isolated failed segments from the part of the data communication network which has not failed by transferring data messages between ones of said loop connected ring paths.

4,683,564

MATRIX SWITCH SYSTEM

Gladstone F. Young, Redding; Richard F. Green, Oxford, both of Conn.; S. David Miller, Buffalo, N.Y., and Thomas J. Quinlan, III, Norwalk, Conn., assignors to Data Switch Corporation, Shelton, Conn.

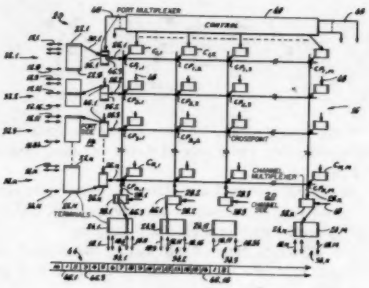
Filed Nov. 22, 1982, Ser. No. 443,193
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—63 **29 Claims**

1. A matrix switch system for coupling a plurality of signals on incoming lines to outgoing lines and with lines associated with a matrix being located on a port side and on a channel side of the matrix, comprising:

matrix means for coupling signals on matrix incoming lines to matrix outgoing lines, said matrix means having a plurality of crosspoints where matrix lines leading to one side are selectively coupled to matrix lines leading to another side;

a plurality of port multiplexer means coupled to multiplex respective groups of port lines with respectively different matrix lines leading to one side of crosspoints of the matrix means;

a plurality of channel multiplexer means coupled to multiplex respective groups of channel lines with respectively different matrix lines leading to other sides of crosspoints of the matrix means;



means for controlling said port and channel multiplexer means and said matrix means to enable bidirectional communication between a port line and a channel line through a matrix crosspoint; said controlling means including:

means for generating a recurring timing signal having time slices; and

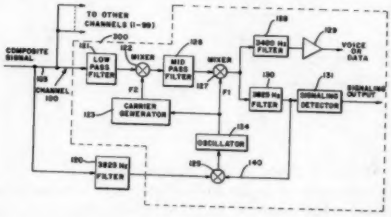
means responsive to the timing signal for coupling during a common time slice a line that is a source of signals on one side of the matrix means to a plurality of lines located on another side of the matrix means.

4,683,565

PHASE CONTROLLED FREQUENCY DIVISION MULTIPLEXED COMMUNICATIONS SYSTEM

Joseph Hanulec, Shoreham, N.Y., assignor to ISC Cardion Electronics, Inc., Woodbury, N.Y.

Filed Mar. 15, 1985, Ser. No. 712,051
Int. Cl.[4] H04J *1/00*
U.S. Cl. 370—69.1 **12 Claims**



1. A frequency division multiplexed, transmission system providing a predictable input to output phase characteristic for signals transmitted over a communications link between a transmitter and a receiver,

(a) said transmitter including means for transmitting a composite signal including:

(i) a first portion including at least one frequency translated multi-component signal including an information signal component and an out of band signalling tone component, and

(ii) a second portion comprising an out of band signalling tone,

(b) said receiver including:

(i) a phase controlled oscillator,

(ii) means responsive to said phase controlled oscillator and to said transmitted composite signal for frequency retranslating said multi-component signal to produce a received information signal and a received out of band signalling tone, and

(iii) phase comparison means responsive to said received out of band signalling tone and to said out of band signalling tone of said second portion of said transmitted signal for controlling said phase controlled oscillator.

4,683,566

DIGITAL RADIO COMMUNICATION SYSTEM

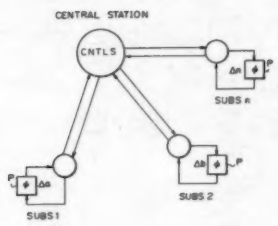
Susumu Sasaki, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 31, 1985, Ser. No. 793,242

Claims priority, application Japan, Nov. 2, 1984, 59-232081

Int. Cl.[4] H04J *3/06*; H04L *7/00*

U.S. Cl. 370—100 **3 Claims**



1. A digital radio communication system in the form of a multipoints to point time division multiplex network, comprising:

a central station including one working transmitter and receiver and one standby transmitter and receiver both said working and standby transmitter and receiver include radio line terminating equipment, a first phase shifting means, connected to said radio line terminating equipment and said transmitter, for adjusting a phase of a transmission signal, a second phase shifting means, connected to said first phase shifting means, for adjusting a phase of a sampling clock signal, and a sampling unit connected to said receiver, said second phase shifter and said radio line terminating equipment to receive a reception signal, having a width from said receiver, whereby a signal propagation delay time of said working transmitter and receiver is adjusted by said first phase shifting means to be equal to that of said standby transmitter and receiver by adjusting the phase of the transmission signal and a phase of the sampling clock signal is adjusted between said second phase shifting means of both receivers to be at the central position of the bit width of the reception signal; and

a plurality of substations, each operatively connected to the corresponding central station using a time-divided digital radio signal, and each having at least clock phase shifting means for adjusting a phase of a transmission signal transmitted by the corresponding substation.

4,683,567

ASYNCHRONOUS SIGNALING SYSTEM FOR DIGITAL COMMUNICATION CHANNEL

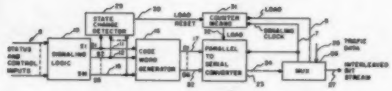
Michael J. Green, and James B. McKay, both of Coquitlam, Canada, assignors to British Columbia Telephone Company, Burnaby, Canada

Filed Jul. 30, 1985, Ser. No. 760,717

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[4] H04J *3/12*

U.S. Cl. 370—110.1 **11 Claims**



1. Apparatus for performing asynchronous signaling in a digital communications system including transmitter and receiver equipment for multiplexing and demultiplexing digital signaling information signals and digital traffic information signals, each of said signaling information signals defining a different one of a plurality of signaling states S1–SM, said apparatus comprising:

means for storing a plurality of M unique N-bit primary digital code words Sm1 each defining a different one of the signal states S1–SM and each having N−1 additional ordered permutations of the order of the N-bits thereof, said additional ordered permutations being designated as secondary code words;

first means responsive to a particular status/control input signal for causing said storing means to serially produce an output signal comprising serial bits B1–BN of one of the primary and secondary code words for a particular signaling state Ss at a signaling clock rate;

means for multiplexing the serially produced bits from said storing means with traffic information bits at signaling time slots in a bit stream, said signaling time slots occurring at the signaling clock rate;

means for transmitting the multiplexed bit stream to receiver equipment;

means for extracting a signaling clock signal from the multiplexed bit stream in the receiver equipment;

means for demultiplexing the multiplexed bit stream in the receiver equipment for producing a stream of serial signaling bits; and

means for producing during each signaling bit interval a first indication that the transmitted signaling state is a prescribed signaling state Sp when there is a match between the most recently received N signaling bits of the serial signaling bit stream and one of the N-bit primary and secondary code words associated with the prescribed signaling state Sp; and producing a second indication when there is not a match between the most recently received N signaling bits of the serial signaling bit stream and any of the primary and secondary code words.

4,683,568

METHOD OF MONITORING COMPUTER ELEMENTS, PARTICULARLY MICROPROCESSORS

Manfred Urban, Auenwald, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

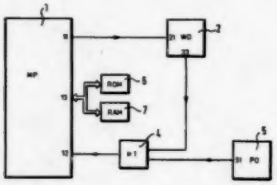
PCT No. PCT/DE84/00232, § 371 Date Jul. 11, 1985, § 102(e) Date Jul. 11, 1985, PCT Pub. No. WO85/02475, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 2, 1984, Ser. No. 760,734

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343227

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—12 **4 Claims**



1. Method for monitoring computer elements (1), particularly microprocessors, having

a reset input (12),

a volatile or eraseable memory (7),

a non-volatile or non-eraseable memory (6),

input/output port means (13) connecting said memories to the computer element (1),

a monitoring device (2) for the computer element (1) which device causes a resetting of the computer element (1), comprising the steps of

detecting a reset signal on said reset input (12),

performing a comparison (62) between a comparison pattern stored in said non-eraseable memory (6) and a pattern present in said eraseable memory (7); and

performing, selectively, one of a complete re-initialization (65) of said microprocessor and a shorter program sequence (64) in dependence upon whether said comparison indicates that the pattern in said volatile or eraseable memory is random.

4,683,569

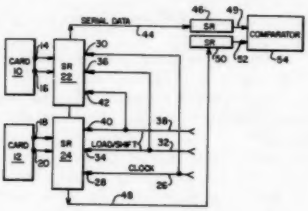
DIAGNOSTIC CIRCUIT UTILIZING BIDIRECTIONAL TEST DATA COMPARISONS

Albert M. Rubin, West Milford, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 21, 1985, Ser. No. 789,528

Int. Cl.[4] G01R *31/28*; G06F *11/00*

U.S. Cl. 371—25 **4 Claims**



4. A method for diagnosing circuit test points comprising the steps:

reading digital test signals from the test points;

storing the read signals;

serially reading the digital signals from storage;

comparing the levels of the signals to predetermined levels indicative of error-free circuit operation;

wherein any bit of the serially read out signal corresponds to a respective test point location and wherein a difference between any bit of the serially read out signal and its predetermined level is indicative of an error at a test point location corresponding to the position of the bit in a serial data stream read from storage; together with the stop of bidirectionally shifting the contents from storage;

comparing the digital signals resulting from the bidirectional shift; and

detecting, as a result of such comparison, faulty operation of a determinable bit of a stored read signal.

4,683,570

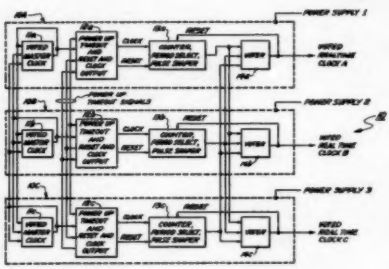
SELF-CHECKING DIGITAL FAULT DETECTOR FOR MODULAR REDUNDANT REAL TIME CLOCK

James F. Bedard, Schenectady, N.Y., and Vilay C. Jaswa, San Jose, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,852

Int. Cl.[4] G06F *11/18*

U.S. Cl. 371—36 **7 Claims**



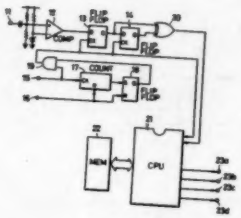
1. A self-checking fault detector for a modular redundant clock of the type that includes a plurality of clock circuits, each producing a clock signal, the detector comprising a majority voter circuit for receiving the clock signals and for producing a voted majority output signal; comparison means for comparing each of the clock signals with the voted majority output signal and for providing a plurality of corresponding comparison signals, one for each clock signal, representative of the results of the comparisons; and means responsive to the plurality of comparison signals for providing a first failure signal indicating a failure of a clock circuit and for providing a second failure signal indicating a failure of the majority voter circuit; wherein the comparison means comprises a plurality of comparison circuit elements, each receiving a different one of the clock signals and the voted majority output, and each providing a separate comparison signal representing the results of the comparison between its received clock signal and the voted majority output signal, said comparison signal having a first state when the clock signal and the voted majority output signal agree, and a second state when the clock signal and the voted majority output signal disagree; and wherein the failure signal providing means comprises a first circuit for providing the first failure signal upon any of the plurality of comparison signals being in the second state, and comprises a second circuit for providing the second failure signal only upon all of the comparison signals being in the second state.

4,683,571

DIGITAL SIGNAL DECODING SYSTEM

Tooru Yamagishi, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 29, 1985, Ser. No. 739,016
Claims priority, application Japan, May 30, 1984, 59-110238; Jun. 18, 1984, 59-124810
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 13 Claims



1. A digital signal decoding system comprising:

input terminal means for receiving a digital signal comprising a plurality of code words through a transmission path, said digital signal being encoded so that each code word is constituted by adding a Hamming correction code to information bits and being modulated according to a self clock modulation system;

demodulating means for obtaining a demodulated signal by demodulating the digital signal from said input terminal means;

first means for generating a demodulated data and a clock signal from the output demodulated signal of said demodulating means, said demodulated data comprising a predetermined number of demodulated code words;

error possibility data generating means for generating error possibility data from said demodulated data and said clock signal which are supplied by said first means, said error possibility data comprising a plurality of error possibility data words in correspondence with said predetermined number of demodulated code words and assuming a first logic value at a bit position corresponding to a bit of said demodulated data whereat an error does not exist and assuming a second logic value at a bit position corresponding to a bit of said demodulated data whereat the possibility that an error exists is high;

second means for sequentially correcting error in said predetermined number of demodulated code words and said plurality of error possibility data words, and decoding corrected demodulated code words and corrected error possibility data words to produce a decoded data; and

first memory means coupled to said second means for prestoring a first table containing a priority of a decoding sequence, said priority of the decoding sequence being the priority with which said predetermined number of demodulated code words are to be corrected and decoded by said second means and being determined by values of a demodulated data word and an error possibility data word,

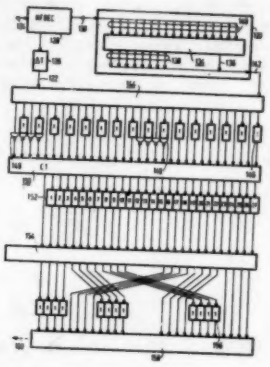
said second means obtaining the priority of the decoding sequence of each demodulated code word from said first table based on each demodulated code word and each corresponding error possibility data word and performing correction and decoding with respect to said predetermined number of demodulated code words and the corresponding error possibility data words in a sequence depending on the priority of the decoding sequences of each demodulated code word, so as to correct error in one or a plurality of bits of each demodulated code word and each corresponding error possibility data word.

4,683,572

DECODING DEVICE FOR CODE SYMBOLS PROTECTED BY REED-SOLOMON CODE

Constant P. M. J. Baggen; Leonardus M. H. E. Driessen; Rudy W. J. Pollen, and Lodewijk B. Vries, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1984, Ser. No. 653,255
Claims priority, application Netherlands, Feb. 29, 1984, 8400630
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 13 Claims



1. A decoding device for a stream of successive code symbols which are protected against symbol errors by a pair of a first and a second cross-interleaved Reed-Solomon codes, the respective symbols of any particular multi-symbol code word of the second code all belonging to different multi-symbol code words of the first code, comprising:

a first input for receiving code symbols of the first code, each associated with a reliability information code in the form of at least one reliability bit;

storage means connected to said first input for storing data symbols of code words of the first code as received, data symbols of code words of the second code, and said reliability information code, said data symbols of the first code if corrected for an error therein by means of the first code, being stored after such correction, until at least all symbols of the relevant code word of the second code are stored together in said storage means,

a first strategy-determining device connected to said first input for receiving, for each code word of the first code, the reliability information code of the symbols contained in the first code word, generating an aggregate reliability information signal for this code word, and generating a strategy indicating signal, said strategy indicating signal identifying a predetermined fixed number of erase symbols in said first code word and also a maximum number of error symbols above said fixed number of erase symbols that is accepted as being correctable, and further, generating a risk indication code (FHCO);

first arithmetic means for receiving all symbols of any code word of the first code and generating therefrom associated first syndrome symbols for such code word;

second arithmetic means connected to said first strategy-determining device for receiving said strategy-indicating signal, connected to said first arithmetic means for receiving said first syndrome symbols, connected to said storage means for accessing selected code symbols and said associated reliability information code for correcting said code symbol by means of an error value calculated therefor, and returning such corrected code symbols to said storage means, and for generating word-wise signalization infor-

mation (UEP, ERUF, NCE, NSFL) signalling a measure of decoding success;

flag processing means including flag hardening element connected to said second arithmetic means for receiving such word-wise signalization information, and to said first strategy-determining device for receiving said risk-indicating code, and generating therefrom for each code symbol of the first code word, a secondary flag information (O, F3, F2, F1) having a value range of at least three discrete values; and indicating a secondary reliability; and

further processing means connected to said storage means for receiving code symbols associated with a code word of the second code and associated secondary flag information, for generating therefrom second syndrome symbols, error locator information, and error value information calculated therefor, and supplying data symbols of a code word of the second code after error processing on a user output.

4,683,573

TEMPERATURE STABILIZATION OF INJECTION LASERS

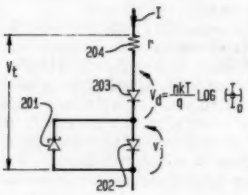
Andres Albanese, Morristown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

PCT No. PCT/US85/01814, § 371 Date Sep. 24, 1985, § 102(e) Date Sep. 24, 1985, PCT Pub. No. WO87/01875, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 24, 1985, Ser. No. 784,878

Int. Cl.⁴ H01S *3/04*

U.S. Cl. 372—34 **5 Claims**



1. Circuitry for stabilizing the ambient temperature of an injection laser, the injection laser having a two-terminal equivalent circuit comprising: a parallel combination of an ideal lasing diode and a zener diode, in series with a bias diode and a resistor, the circuitry comprising

means, in electrical energy transfer relation with the injection laser, for generating a compensation voltage matching a sum of the voltages developed across the resistor and the bias diode of the laser,

means for continuously monitoring a voltage across the two terminals of the injection laser to produce a monitored voltage indicative of the ambient temperature of the lasing diode,

means for deriving from said compensation voltage and said monitored voltage a derived voltage corresponding to a voltage developed across the lasing diode of the laser, and

means for adjusting the ambient temperature of the injection laser to stabilize the laser wavelength in response to said derived voltage.

4,683,574

SEMICONDUCTOR LASER DIODE WITH BURIED HETERO-STRUCTURE

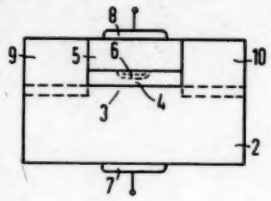
Jochen Heinen, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,399

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435307

Int. Cl.⁴ H01S *3/10*

U.S. Cl. 372—44 **16 Claims**



1. A laser diode comprising:

a semiconductor substrate,

a plurality of strip shaped heterogenous layers sequentially arranged vertically on said substrate, said heterogenous layers between them providing a strip shaped laser active zone,

additional doped semiconductor structures having a lower refractive index than said heterogenous layers lying laterally adjacent to said strip shaped heterogenous layers,

a zone adjacent to said additional structures laterally of said homogenous layers, said zone having a conductivity type different from that of said additional structures, and of the conductivity of the lowermost of said heterogenous layers, thereby providing a blocking pn junction at the side of said heterogenous layers at the boundary between said lowermost layer and said additional structures,

said zone having its dopant confined to the direction of the boundary surface between the adjacent zone and the adjoining additional structures, said dopant being diffused only from the boundary surface between said adjacent zone and said additional structure and not diffused from said additional structures.

4,683,575

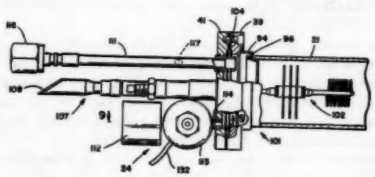
GAS FILL SYSTEM FOR A LASER TUBE

Lee R. Carlson, Pleasanton; Denes A. Hegedus, Redwood City; Steven M. Jarrett, Los Altos; Michael F. Miller, Mountain View; Martin E. Riley, Grass Valley, and David L. Wright, Rough and Ready, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Division of Ser. No. 649,206, Sep. 10, 1984, Pat. No. 4,649,547. This application Sep. 11, 1986, Ser. No. 906,121

Int. Cl.⁴ H01S *3/22*

U.S. Cl. 372—59 **3 Claims**



1. A gas fill system for the plasma tube of a gas laser, comprising:

a gas reservoir containing gas under much greater pressure than that in the plasma tube;

gas conducting means between the reservoir and the plasma tube, forming an inlet chamber and an outlet chamber, a first conduit from the reservoir to the inlet chamber, a second conduit from the outlet chamber to the plasma tube, and a gas metering chamber between the inlet chamber and outlet chamber; and

valve means including first and second valves for normally closing the metering chamber from both the inlet and outlet chambers and for selectively opening the first valve to open the metering chamber to the inlet chamber, to admit reservoir gas pressure into the metering chamber, then for closing the first valve to isolate the metered volume of gas and then opening the second valve to open the metering chamber to the plasma tube to admit the metered gas to the plasma tube.

4,683,576

OPTICAL PUMPING LASER SYSTEM

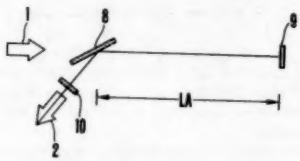
Akira Nagashima, Ibaragi, and Osamu Sukegawa, Tokyo, both of Japan, assignors to Japan Atomic Energy Research Institute and NEC Corporation, both of Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,720

Claims priority, application Japan, Oct. 19, 1984, 59-219873

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—98 **6 Claims**



1. An optical pumping laser system comprising:

an optical element functioning as a Brewster plate with respect to a pumping beam and functioning as a reflection mirror with respect to an oscillation laser beam;

a total reflection mirror spaced apart from said optical element and located on an axis of the pumping beam with the optical element disposed between the total reflection mirror and a pumping beam source; and

a partially reflecting mirror for outputting the oscillation laser beam, the partially reflecting mirrors being disposed off the axis of the pumping beam and arranged relative to said optical element and to said total reflection mirror to constitute a laser cavity for the oscillation laser beam with said optical element functioning as a tilted reflector

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4,683,577

METHOD AND APPARATUS FOR REGULATING ARC DISCHARGE FURNACE

Karlheinz Bretthauer, and Hans-Dietrich Obenauf, both of Clausthal-Zellerfeld, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,921

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512189

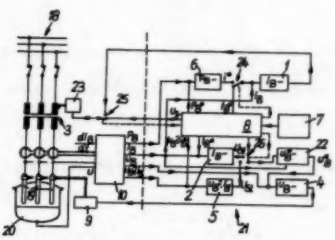
Int. Cl.[4] H05B *7/148*

U.S. Cl. 373—105 **17 Claims**

9. Apparatus for regulating an arc discharge furnace, which furnace has a lining, a plurality of electrodes disposed above a bath of conductive material, adjustable transformer means connected for applying to each electrode a voltage which causes an arc current proportional to the applied transformer voltage to flow between the electrode and the bath, voltage varying means for varying the voltage applied by the transformer to each electrode, and electrode height adjusting means for varying the vertical spacing between each electrode and the bath, said apparatus comprising:

signal generator means providing representations of desired values for a maximum of two of the following parameters: the voltage of the arc current produced by at least one electrode; the arc current produced by the at least one electrode; the power of the arc produced by the at least one electrode; a parameter which is proportional to the wear caused to the furnace lining by the arc produced by the at least one electrode; and the fornace voltage acting as a correcting variable for the voltage applied to the one electrode by the transformer;

measuring means connected for measuring the actual current and voltage of the arc produced by the at least one electrode for and for producing representations of actual values for the arc voltage, arc current, arc power, and the parameter proportional to wear for the at least one electrode; and



control means connected to said signal generator means and said measuring means, and to the voltage varying means and the electrode height adjusting means for controlling the voltage varying means as a function of a first one of the selected desired values and the height adjusting means as a function of the second one of the selected desired values; wherein

said control means comprise: a first regulator connected for generating a signal for controlling the electrode height adjusting means; a second regulator connected for generating a signal for controlling the voltage varying means; a third regulator connected to said first regulator for supplying a signal for controlling the signal generated by said first regulator means; and a wear value regulator connected for supplying a signal to a selected one of said first and third regulators.

4,683,578

AUTOMATIC GAIN CONTROL USING THE EXTREME POINTS OF A CONSTELLATION

William L. Betts, St. Petersburgh, and Edward S. Zuranski, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Jul. 5, 1985, Ser. No. 752,398

Int. Cl.[4] H04L *27/08*

U.S. Cl. 375—98 **3 Claims**

1. In a modem for receiving a QAM encoded data signal which corresponds to a received vector, and having a decoder adapted to generate an ideal vector corresponding to said received vector, said ideal vector defining a point of a signal constellation, an error corrector comprising:

means for obtaining the radial component in the direction of said ideal vector of an error vector, said error vector being a difference vector between said received and ideal vectors;

means for obtaining an instantaneous gain error signal determined by said radial component;

a secondary detector for generating an adjustment signal

when said ideal vector corresponds to an extreme point of said signal constellation;

adjustment means responsive to said adjustment signal for modifying said instantaneous gain error signal to generate a final gain error signal; and

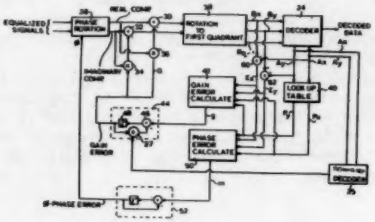
means for modifying said received vector in accordance with said final gain error signal and wherein said instantaneous gain error signal is given by gain error signal $g=E_xP_x-E_yP_y$ where

E_x and E_y are the real and imaginary components of the error vector;

$P_x=\cos s$;

$P_y=\sin s$;

s being an instantaneous phase angle of the ideal vector.



4,683,579

METHOD AND APPARATUS FOR MEASURING BLOOD CONSTITUENT COUNTS

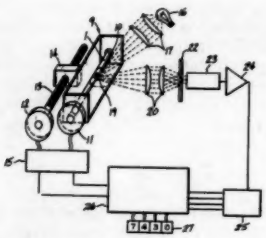
Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Filed Dec. 27, 1985, Ser. No. 813,978

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] G01N *15/02, 21/00*

U.S. Cl. 377—11 **9 Claims**



1. An optical scanning apparatus for measuring blood cell counts in a centrifuged sample of anticoagulated whole blood contained in a transparent tube wherein the blood cell types are separated into different layers in the tube, said apparatus comprising:

(a) means for supporting the tube;

(b) a source of near infra-red region-light operable to illuminate the blood cell layers in the tube;

(c) photosensor means focused on the illuminated blood cell layers in the tube and operable to scan the cell layers to detect differing light scattering properties of the different cell types in the layers of cells;

(d) means for causing relative movement between the tube and said photosensor means for enabling said photosensor means to scan the layers of blood cells at all different locations circumferentially of the tube;

(e) converter means operably connected to said photosensor means for converting analog signals from said photosensor means to digital form; and

(f) computer means operably connected to said converter means for receiving and storing digital signals from said converter means, said computer means further being operable to utilize the signals received to calculate the average axial dimension of each layer of cells scanned to determine from previously inputted data the true cell counts for each layer of cells scanned.

4,683,580

CCD OUTPUT SIGNAL PROCESSING CIRCUIT FOR USE IN AN IMAGE PICK-UP DEVICE

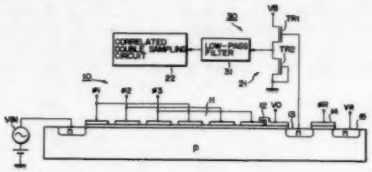
Yoshiyuki Matsunaga, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 7, 1985, Ser. No. 763,225

Claims priority, application Japan, Aug. 20, 1984, 59-172746

Int. Cl.[4] H03H *17/06;* G11C *19/28, 27/02*

U.S. Cl. 377—60 **10 Claims**



1. A CCD output signal generating circuit comprising:

a CCD type charge transfer device for transferring and outputting signal charges in response to a drive signal of a frequency f_c;

an output circuit for generating an output signal corresponding to output signal charges from said CCD type charge transfer device;

a low-pass filter circuit, having a cut-off frequency limited to a range of $2f_c$ to $6f_c$, which is connected to said output circuit and eliminates a high frequency component over the cut-off frequency of an output signal from said output circuit; and

a correlated double sampling circuit, connected to said low-pass filter circuit, for sampling and holding an output signal from said low-pass filter circuit.

4,683,581

APPARATUS FOR X-RAY PHOTOGRAPHY OF THE AREA OF THE DENTITION AND OF THE JAWS

Erkki Tammisalo; Heikki Kanerva, both of Turku; Jaakko Aarnio, Helsinki; Markku Wederhorn, Espoo, and Kai Laner, Helsinki, all of Finland, assignors to Orion-Yhtyma, Nilsiankatu, Finland

Filed Jan. 31, 1985, Ser. No. 696,776

Claims priority, application Finland, Feb. 1, 1984, 840412

The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.

Int. Cl.[4] A61B *6/14*

U.S. Cl. 378—38 **9 Claims**

1. An apparatus for X-ray photography of the area of dentition and the jaws, said apparatus comprising

a stationary frame part; a bearing supported in the frame part and movable in relation thereto;

a support arm mounted for rotational movement in relation to said bearing:

a source of X-ray radiation provided at one end of the support arm;

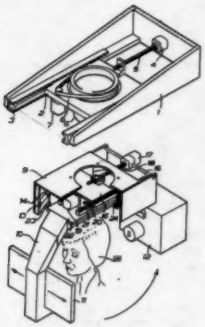
means for supporting and moving an X-ray film provided at the other end of the support arm;

first means for rotating the support arm; second means for

transferring the axis of rotation of the support arm along a predetermined path during the rotation;

the movements of the support arm and the film being synchronized so that, during the movement, an image of the dental arch of a patient, is obtained on the film;

bracket means for mounting the support arm in relation to the bearing part;



guide means on said bracket means, said guide means extending in the longitudinal direction of the support arm;

third means provided on said bracket means for transferring of the support arm in relation to its axis of rotation, together with the X-ray source and the X-ray film in a direction parallel to said longitudinal direction.

4,683,582

PORTABLE ROENTGENOGRAPHIC CEPHALOSTAT

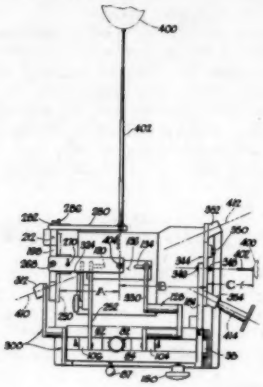
John L. Spolyar, 2769 Homewood Dr., Troy, Mich. 48098

Continuation of Ser. No. 506,005, Jun. 20, 1983. This application Jul. 22, 1985, Ser. No. 757,451

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] G03B *42/02*

U.S. Cl. 378—174 **16 Claims**



1. A portable cephalostat, comprising portable body means, first means defining a non-resilient fixed reference plane of elevation carried by said body means and against which the back of a patient's head is to be directly located, second means for locating first unexposed film at a preselected elevation below the back of the patient's head and said fixed reference plane of elevation, third means for locating second unexposed film to one side of the patient's head when the back of said patient's head is located against said fixed reference plane of elevation, fourth means for locating third unexposed film at generally the top of the patient's head when the back of said patient's head is located against said fixed reference plane of elevation, and fifth means for guidingly positioning said patient's head along said fixed reference plane of elevation as to have the mid-sagittal plane of said patient's head situated at a preselected distance from said second unexposed film and for determining the elevation above the plane of said first film of the axis of said patient's auditory canals when the mid-sagittal plane of the patient's head is at said preselected distance, wherein said second means comprises reference surface means carried by said body means, wherein said third means comprises support means carried by said body means, wherein said support means is effective to support said second unexposed film in a generally vertical position generally parallel to said mid-sagittal plane, wherein said fifth means comprises first and second arm-like containing means, said first arm-like containing means being effective to be disposed at a first side of the patient's head, said second arm-like containing means being effective to be disposed at a second side of the patient's head opposite to said first side, first ear canal locating means carried by said first arm-like containing means and extending generally toward said second arm-like containing means, second ear canal locating means carried by said second arm-like containing means and extending generally toward said first arm-like containing means, said first and second arm-like containing means being adjustable through an arcuate path of movement simultaneously toward and away from said fixed reference plane of elevation as to enable said first and second ear canal locating means to be at an appropriate elevation with respect to said fixed reference plane of elevation as to enable the respective reception of said first and second ear canal locating means by the auditory canals of the patient's head, wherein said arcuate path of movement is about an axis of rotation, wherein said axis of rotation is parallel to said fixed reference plane of elevation, and said first and second arm-like containing means also being simultaneously movable toward and away from each other as to thereby respectively generally contain and release said patient's head.

4,683,583

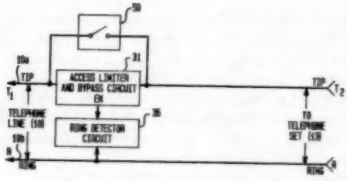
METHOD AND APPARATUS FOR CONTROLLING TELEPHONE LINE ACCESS

Michael G. Kossor, 317 W. First Ave., Roselle, N.J. 07203

Filed Apr. 1, 1985, Ser. No. 718,565

Int. Cl.[4] H04M *1/66*

U.S. Cl. 379—200 **9 Claims**



1. A security unit to protect a telephone line from unauthorized outgoing calls from a telephone unit including a base telephone, said security unit comprising in combination:

means comprising an access limiter and bypass circuit interposed in series circuit relation between said base telephone and said telephone line;

means comprising a ring detector circuit constructed to be connected in circuit relation between said telephone line and said access limiter and bypass circuit for detecting incoming telephone call ring signals; and

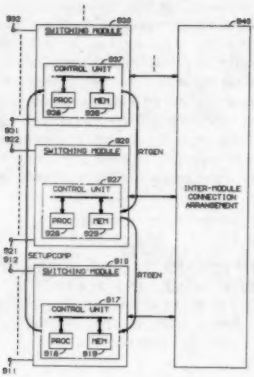
access enabling means connected in circuit relation with said ring detector circuit and said access limiter and bypass circuit, constructed when said telephone unit is off-hook to block said access limiter and bypass circuit to normal telephone communication including outgoing telephone calls and dial information between said base telephone unit and said telephone line in response to a first condition, and to unblock said access limiter and bypass circuit to said normal telephone communication including outgoing telephone calls and dial information between said base telephone and said telephone line in response to a second condition, wherein said means comprises said ring detector circuit and is responsive to the incoming telephone signals whether or not said access limiter and bypass circuit is unblocked to outgoing calls.

4,683,584

DIRECTORY NUMBER TRANSLATION IN A DISTRIBUTED CONTROL SWITCHING SYSTEM

Shih-Jeh Chang, Naperville; Richard T. Emery, Montgomery, and Shafik J. Hakim, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 7, 1985, Ser. No. 699,463
Int. Cl.[4] H04Q *3/47*
U.S. Cl. 379—269 **21 Claims**



1. In a distributed call processing system for use in a switching system having a plurality of ports defined by an associated plurality of directory numbers, said call processing system comprising a plurality of control units each associated with a subset of said plurality of ports and each storing translation data defining, for each of a subset of said plurality of directory numbers, the one of said plurality of ports defined by said each of said subset of directory numbers,

a call processing method comprising

a first one of said control units receiving a given directory number for a call from one of said ports associated with said first control unit,

said first control unit accessing its translation data and determining that a given one of said plurality of ports is defined by said given directory number,

said first control unit determining that said given port is associated with a second one of said control units,

said first control unit transmitting to said second control unit a message defining said given port and

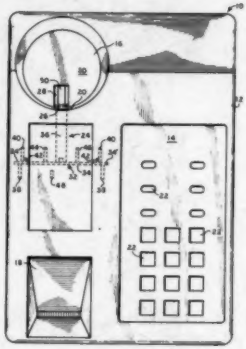
said second control unit effecting the transmission of an alerting signal to said given port.

4,683,585

TELEPHONE HOOKING POST AND ASSEMBLY

James R. Watkins, Jr., and Ken T. Huang, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 603,812, Apr. 25, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 858,081
Int. Cl.[4] H04M *1/08*
U.S. Cl. 379—426 **17 Claims**



1. An arrangement for releasably retaining a telephone apparatus in a standby condition comprising:

a handset including an earpiece having a front face with a lip surface portion projecting to an edge;

a base having a shelf portion for receiving said lip surface portion;

a hooking post member having a hooking post portion protruding through and beyond said shelf portion and being movable towards and away from said shelf portion, and a spring means portion for resiliently restraining movement of said hooking post member towards said shelf portion, said hooking post portion being integral with said spring means portion; and

switch hook means separate from said hooking post member and having an outer surface portion arranged to engage said earpiece front face; whereby,

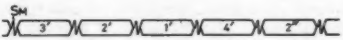
when said earpiece is brought into engagement with said base upon said shelf portion, said telephone apparatus is releasably retained in a standby condition with said said hooking post portion resiliently urged by said spring means portion into contact with said earpiece lip surface for releasably retaining said earpiece in engagement with said base and with said earpiece front face engaging said switch hook means for actuating said switch hook means.

4,683,586

SCRAMBLING SYSTEM FOR AN AUDIO FREQUENCY SIGNAL

Akira Sakamoto; Takeshi Fukami, both of Tokyo; Takehiro Sugita, Chigasaki, and Masakatsu Toyoshima, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,899
Claims priority, application Japan, Jan. 11, 1983, 58-2481
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—48 **3 Claims**



1. Apparatus for scrambling and unscrambling an audio frequency analog signal which is digitized and divided into blocks, each block consisting of a plurality of adjoining multi-

ple-bit segments arranged in an original order; said apparatus comprising:

encoding means for providing at an end of each of said segments a redundant signal portion from an adjacent end of one of said adjoining segments, thereby to form enlarged segments, rearranging and uniformly timebase-compressing by a selected amount said enlarged segments to form rearranged segments of the same duration as the original segments, and inserting a marker signal in place of each of said redundant signal portions to form an encoded signal on a predetermined time base for transmission to a decoding means, during which transmission the rearranged segments of said encoded signal may be randomly timebase-compressed or timebase-expanded relative to said predetermined time base; and

said decoding means receiving said encoded signal for detecting successive ones of said marker signals in said received encoded signal, for measuring the respective separations between successive ones of said marker signals as detected, and for uniformly timebase-expanding said segments by the reciprocal of said selected amount used in said encoding means for said uniformly timebase-compressing and restoring the segments to said original order of said segments prior to the encoding thereof, said segments, as restored to the original order by said decoding means, each having a respective length proportional to the respective one of said separations measured between the preceding and succeeding marker signals in said decoding means, said decoding means comprising first memory means having a plurality of addresses for storing data representing respective segments of the received encoded signal corresponding to one of said blocks;

second memory means for storing data representing the addresses in said first memory means at which said segments of said one of said blocks are stored;

third memory means for storing data representing a duration of time for each of said segments stored in said first memory means; and

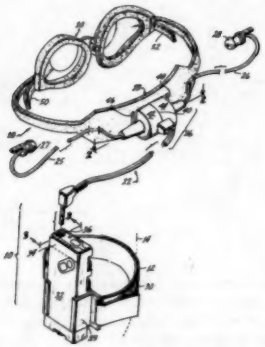
means for reading out from said first memory means the data stored at said addresses in an order determined by data from said second memory means and during a time determined by data from said third memory means.

4,683,587

SUBMERSIBLE PERSONAL STEREO

Michael D. Silverman, 16410 Calahan St., Sepulveda, Calif. 91343

Filed Jun. 11, 1985, Ser. No. 743,385
Int. Cl.[4] H04R *5/00*
U.S. Cl. 381—25 **12 Claims**



1. Portable waterproof stereo sound headphone system for use with a source of electronic signals having means for attachment to the user, comprising at least two transducers for converting electrical signals to sound signals,

a transducer housing having a pair of separate sound chambers, said transducers being mounted in said chambers,

waterproof electrical signal transmission means for connecting the transducers to said signal source,

means for attaching the housing to the user,

left and right air transmission lines for transmitting sound, each of said lines including a section of tubing connected at one end to respective one of said chambers and sealed in air tight relation to said housing so that said chambers and associated tubing represents an air tight volume containing a column of air extending end-to-end to said tubing,

a pair of earplugs each having a hole therein and attached to the other end of the respective tubing section so that sound passes through said tubing section and earplug to the ear of the wearer,

said tubing and earplugs having an inside diameter large enough to pass sound with fidelity, but small enough to impede entrance of water by a combination of capillary action in relation to the surface tension and contact angle of water, together with compression resistance of the sealed column of air contained within each of said sealed tubing and chamber volumes.

4,683,588

FACE MASK WITH VOICE MODIFYING CAPABILITY

Mel Goldberg, c/o Topstone Industries, Inc., 2 Augusta Dr., Danbury, Conn. 06810

Filed Oct. 17, 1985, Ser. No. 788,349
Int. Cl.[4] H03G *3/00*
U.S. Cl. 381—61 **7 Claims**

1. A face mask comprising:

(a) a face covering disguise section having a mouth area in the form of a forwardly projecting protrusion, said protrusion having a retention rim, integrally molded with said disguise section;

(b) a speaker proximally secured within said protrusion;

(c) a microphone proximally secured to said mouth area;

(d) voice signal modification means electrically connected between said microphone and said speaker and also located within said protrusion, said retention rim serving to firmly abut against said voice signal modification means to hold the same in place yet being resilient enough to allow for repeated and easy removal and replacement of said voice signal modification means within said protrusion;

(e) electrical power means for electrically connecting and driving said microphone, said voice signal modification means and said speaker; and

(f) said voice signal modification means being modularly connected to said speaker and being capable of easy dis-

connection from and replacement by a second voice signal modification means.

4,683,589

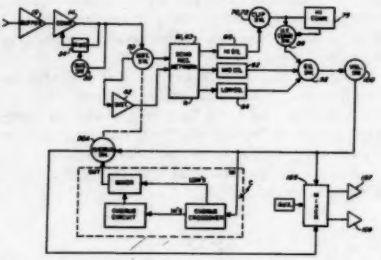
ELECTRONIC AUDIO SYSTEM

Donald T. Scholz, Wayland, and Augustine Antoine, Dorchester, both of Mass., assignors to Scholz Research & Development, Waltham, Mass.

Continuation of Ser. No. 566,189, Dec. 28, 1983, abandoned. This application Nov. 27, 1985, Ser. No. 802,694

Int. Cl.[4] H03G *3/00*

U.S. Cl. 381—61 **17 Claims**



1. An electronic audio signal system for processing signals in the audio frequency range and comprising, input circuit means for receiving the audio signal, filter means cmprising separate high EQ, mid EQ and low EQ filter circuits, said input circuit means coupling to said filter means, EQ switch means coupled from the output of said low, mid and high EQ filter circuits for selectively establishing multiple frequency response waveforms, and output circuit means coupled from said EQ switch means, said input circuit means comprising a compressor, a sustain control switch means and a detector means comprising an RMS detector, and a feedback loop between the input and the output of the compressor including in the feedback loop said RMS detector and said sustain control switch means.

4,683,590

INVERSE CONTROL SYSTEM

Masato Miyoshi, Tokorozawa; Yutaka Kaneda, Tanashi, and Juro Ohga, Kamakura, all of Japan, assignors to Nippon Telegraph and Telphone Corporation, Tokyo, Japan

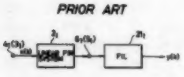
Filed Mar. 14, 1986, Ser. No. 839,677

Claims priority, application Japan, Mar. 18, 1985, 60-53886; Feb. 17, 1986, 61-32659

Int. Cl.[4] H04B *15/00;* **G10K** *11/16;* **G11B** *3/00*

U.S. Cl. 381—71 **25 Claims**

PRIOR ART



2. An inverse control system for an m-input n-output (m being 1 or greater integer, n being an integer greater than m) linear finite impulse response (FIR) system defining m-n signal transmission channels between m input points and n output points, with n receiving elements being disposed at the respective n output points for receiving signals provided to said linear FIR system, wherein

said inverse control system is disposed between said n receiving elements and n input terminals of adder means for effecting an inverse control such as to provide desired impulse responses between the output side of said adder means and said m input points;

said inverse control system comprises n FIR filters disposed between said n receiving elements and the n input terminals of said adder means, respectively;

a j-th(j=1, 2, . . . , n) one of said n FIR filters connected to a j-th one of said output points through an associated one of said receiving elements having a number L_i of taps which satisfies the relationships represented by

$$\sum_{s=1}^{n} L_s \geq \sum_{t=1}^{m} (w_{tj} + L_j - 1) \tag{1a}$$

$$w_{ij} + L_j - 1 \geq P_i \tag{1b}$$

for all i=1, 2, . . . , m and j=1, 2, . . . , n where w_{ij} is the number of discrete signals representing the impulse response $g_{ij}(k)$ of said signal transmission channel between an i-th one of said m input points and the j-th output point of said linear FIR system and P_i is the number of discrete signals representing said desired impulse response $r_i(k)$ between said i-th input point and output side of said adder means; and

said j-th FIR filter having filter coefficients $h_j(k)$ satisfying a relationship

$$r_i(k) = \sum_{j=1}^{n} g_{ij}(k) * h_j(k) \tag{2}$$

for all i=1, 2, . . . , m

where * represents a discrete convolution.

4,683,591

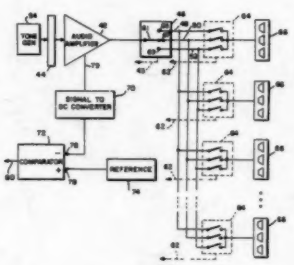
PROPORTIONAL POWER DEMAND AUDIO AMPLIFIER CONTROL

Brian D. Dawson, and James R. Leacock, both of Lincoln, Nebr., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 29, 1985, Ser. No. 728,408

Int. Cl.[4] H03F *21/00*

U.S. Cl. 381—85 **6 Claims**



1. A proportional audio power demand system comprising a plurality of speaker banks, each speaker bank having at least one speaker, at least one audio channel, a plurality of amplifiers, amplifier coupling means for selectively coupling each amplifier to the channel, speaker bank coupling means for selectively coupling each speaker bank to the channel, control means for controlling the amplifier coupling means and the

speaker bank coupling means to cause at least one amplifier and one speaker bank to be coupled to the channel, means for sensing the power output of the amplifier, means for coupling the sensing means to the control means and to the amplifier, means for coupling the amplifier coupling means to the control means, and means for coupling the speaker bank coupling means to the control means, the control means including means for causing the speaker bank coupling means to sequentially couple one or more speaker banks to the channel and for determining, after each speaker bank has been coupled, whether to couple an additional amplifier to the channel based upon the sensed audio power, and for causing said amplifier coupling means to couple said additional amplifier if so determined.

291,020

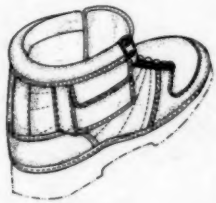
POCKETED BOOT UPPER

Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Filed Mar. 30, 1984, Ser. No. 595,520

Term of patent 14 years

U.S. Cl. D2—272



291,021

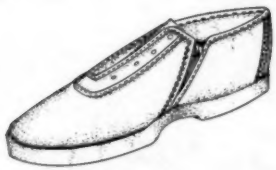
POCKETED SHOE

Adelino Caldeira, Taunton, Mass., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.

Filed Jun. 4, 1984, Ser. No. 617,226

Term of patent 14 years

U.S. Cl. D2—309



291,022

DISPOSABLE SHOE SHINE KIT

Richard D. Erickson, 362 N. Shady View, Des Moines, Iowa 50317

Filed Dec. 10, 1984, Ser. No. 679,994

Term of patent 14 years

U.S. Cl. D3—30.5

291,023

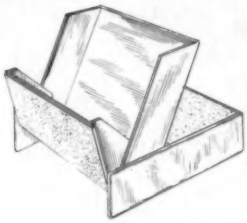
STORAGE CASE FOR FLAT ARTICLES

Craig D. Drake, and Craig W. Crist, both of Muscatine, Iowa, assignors to Ring King Visibles, Inc., Muscatine, Iowa

Filed Aug. 3, 1984, Ser. No. 637,559

Term of patent 14 years

U.S. Cl. D3—35



291,024

CASE FOR A MAGNETIC TAPE CASSETTE OR THE LIKE

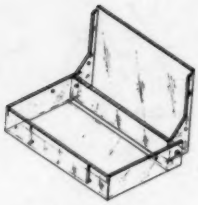
Katsutoshi Kikuchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 678,153

Claims priority, application Japan, Jul. 2, 1984, 59-27234

Term of patent 14 years

U.S. Cl. D3—35



291,025

CONTAINER FOR MAGNETIC TAPE MAGAZINES

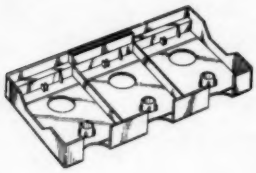
Nobuaki Matsutsuka, Mito, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 10, 1984, Ser. No. 680,055

Claims priority, application Japan, Jun. 14, 1984, 59-88356

Term of patent 14 years

U.S. Cl. D3—35



291,026

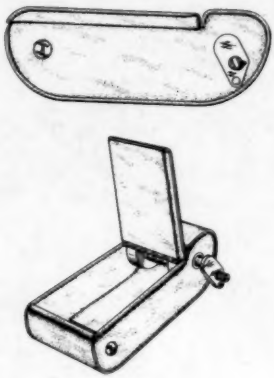
ARMREST ENCLOSURE FOR AN AUTOMOBILE TELEPHONE

Samuel W. Bird, Jr., 338 Sugar Hill Rd., Falls Village, Conn. 06031

Filed Jan. 7, 1985, Ser. No. 689,578

Term of patent 14 years

U.S. Cl. D3—40



291,027

CASE FOR A WORD PROCESSOR

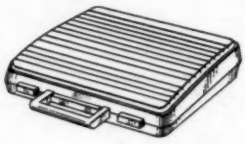
Junji Hirooka, Higashimurayama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,215

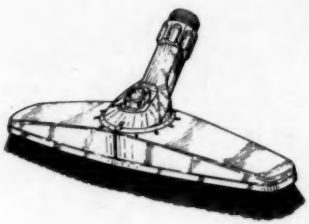
Claims priority, application Japan, Jul. 2, 1984, 59-27239

Term of patent 14 years

U.S. Cl. D3—76

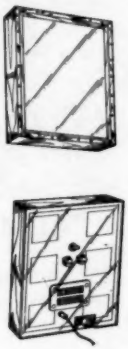


291,028
FOUNTAIN BRUSH
Franco Clivio, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH & Co. KG
Filed Dec. 17, 1984, Ser. No. 682,065
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, GRAIII14638403
The portion of the term of this patent subsequent to Jul. 21, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—115

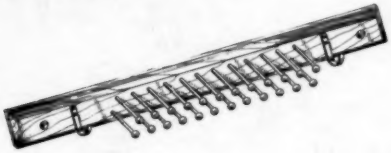


291,029
BRUSH
Grant D. Purvis, 47 Totara Road, Miramar; Raymond F. Grout, 6 Margaret Street, Levin, and Grant Harrison, 12A Park Avenue, Waikanae, all of New Zealand
Filed Apr. 25, 1985, Ser. No. 727,383
Term of patent 14 years
U.S. Cl. D4—118

291,030
ILLUMINATED PICTURE FRAME
George Butterfield, Rte. 2, P.O. Box 180, New Caney, Tex. 77357
Filed Aug. 23, 1984, Ser. No. 643,484
Term of patent 14 years
U.S. Cl. D6—308

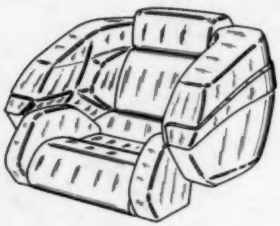


291,031
COMBINED TIE AND BELT RACK
William A. Luongo, 38 Main St., Malden, Mass. 02148
Filed Nov. 1, 1985, Ser. No. 803,865
Term of patent 14 years
U.S. Cl. D6—323



291,032
CHILD'S BOOSTER SEAT
Bruce M. Sauter, and Orville E. Snyder, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.
Filed Mar. 14, 1985, Ser. No. 712,005
Term of patent 14 years
U.S. Cl. D6—333

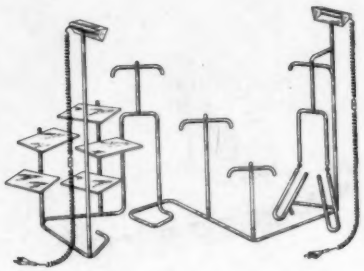
291,033
CHAIR
Michael E. McLeod, 28645 S. Pointe Dr., Grosse Ile, Mich. 48138
Filed Apr. 24, 1985, Ser. No. 726,675
Term of patent 14 years
U.S. Cl. D6—334



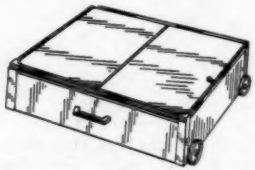
291,034
ROCKING CHAIR
David W. Burns, P.O. Box 2465, Shelby, N.C. 28151
Filed Feb. 22, 1985, Ser. No. 704,479
Term of patent 14 years
U.S. Cl. D6—348

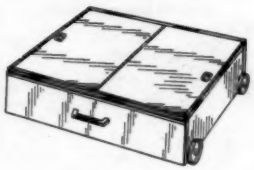
291,035
CHAIR
Babette L. Strousse, Manhattan Beach, and Stephen H. Kaminski, Burbank, both of Calif., assignors to Samsonite Corporation, Denver, Colo.
Filed Sep. 11, 1984, Ser. No. 649,787
Term of patent 14 years
U.S. Cl. D6—380

291,036
COMBINED ILLUMINABLE DISPLAY SHELF AND CLOTHES RACK
Tobia Scarpa, and Afra Bianchi Scarpa, both of Tervignano, Italy, assignors to Centro Studi E Servizi Moda Di Paolo Bertagnin E C. S.A.S., Villorba, Italy
Filed Aug. 8, 1984, Ser. No. 638,890
Claims priority, application Italy, Feb. 9, 1984, 20788/84[U]
Term of patent 14 years
U.S. Cl. D6—399

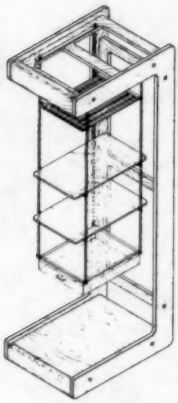


291,037
STORAGE CABINET
Milton E. Handler, Northbrook; Richard Sylvan, Glenview; Herbert Baisch, Palatine, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Continuation-in-part of Ser. No. 741,749, Jun. 10, 1985, abandoned. This application Mar. 4, 1986, Ser. No. 841,698
Term of patent 14 years
U.S. Cl. D6—432

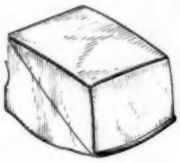




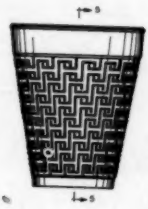
291,038
SHELF UNIT
James E. Hice, 7858 Lumber Jack, Houston, Tex. 77040
Filed Apr. 15, 1985, Ser. No. 723,363
Term of patent 14 years
U.S. Cl. D6—479



291,039
CLEANING WAND CADDY
David J. Bokmiller, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.
Filed Sep. 20, 1984, Ser. No. 652,870
Term of patent 14 years
U.S. Cl. D6—551



291,040
BEVERAGE CUP
Robert C. Dart, Okemos, Mich., assignor to Dart Container Corporation, Mason, Mich.
Filed Feb. 11, 1985, Ser. No. 700,528
Term of patent 14 years
U.S. Cl. D7—6



291,041

COVERED VEGETABLE DISH

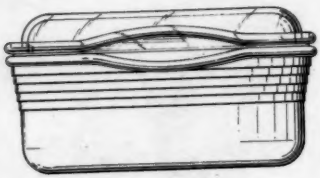
Kenneth Grange, Acrise Cottage, 53 Christchurch Hill, London, England

Filed Feb. 21, 1984, Ser. No. 581,674

Claims priority, application United Kingdom, Aug. 19, 1983, 1014744

Term of patent 14 years

U.S. Cl. D7—18



291,042

COMPARTMENTED DISH

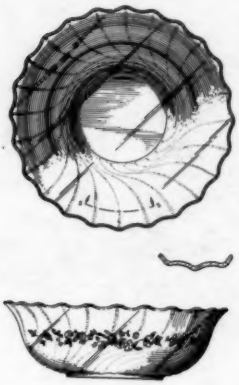
William K. Fahey, Longwood, Fla., and Augusto A. Picozza, Johnston, R.I., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Dec. 26, 1984, Ser. No. 686,321

Term of patent 14 years

U.S. Cl. D7—27

291,043
MULTI-PURPOSE BOWL OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed Feb. 22, 1985, Ser. No. 704,559
Term of patent 14 years
U.S. Cl. D7—28



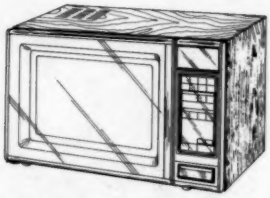
291,044
BEVERAGE CAN HOLDER
Glenn R. Canning, 815 Tamarack Ave., Carlsbad, Calif. 92008
Filed Mar. 26, 1985, Ser. No. 716,119
Term of patent 14 years
U.S. Cl. D7—70

291,045
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jun. 18, 1984, Ser. No. 621,803
Term of patent 14 years
U.S. Cl. D7—137

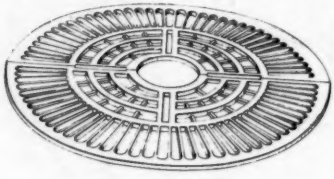
291,046
SPOON
Stanley A. Johnson, Brookfield, Wis., assignor to The Vollrath Company, Sheboygan, Wis.
Filed Mar. 18, 1985, Ser. No. 712,790
Term of patent 14 years
U.S. Cl. D7—137

291,047
COMPACT PORTABLE KITCHEN
Phillip M. Pappas, 2318 Bluebonnet Blvd., Houston, Tex. 77030
Filed Nov. 21, 1985, Ser. No. 805,993
Term of patent 14 years
U.S. Cl. D7—334

291,048
MICROWAVE OVEN
Masayoshi Kubo; Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Oct. 16, 1984, Ser. No. 663,247
Claims priority, application Japan, Apr. 16, 1984, 59-15254
The portion of the term of this patent subsequent to Jul. 14, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



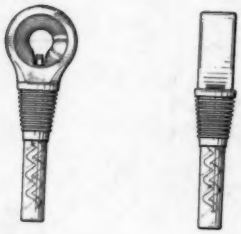
291,049
TREE DRAIN GRATE OR SIMILAR ARTICLE
Robert E. Haggard, Snohomish, Wash., assignor to Merry Haggard, Snohomish, Wash.
Division of Ser. No. 575,420, Jan. 30, 1984. This application Apr. 23, 1986, Ser. No. 857,568
Term of patent 14 years
U.S. Cl. D8—1



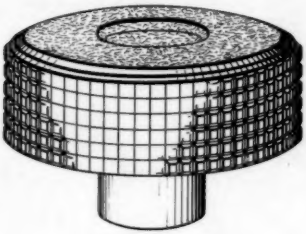
291,050
ECOLOGY TAB CAN OPENING RING
Thomas S. McIntire, 70-B W. Franklin St., Centerville, Ohio 45459
Filed Sep. 24, 1984, Ser. No. 653,994
Term of patent 14 years
U.S. Cl. D8—18

291,051
PLASTIC BUCKET LID REMOVAL TOOL
John DiFede, 24878 Tioga Rd., Hayward, Calif. 94544
Filed Aug. 13, 1984, Ser. No. 639,850
Term of patent 14 years
U.S. Cl. D8—40

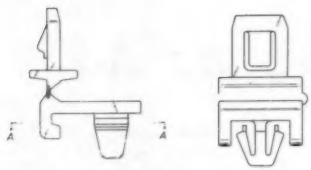
291,052
COMBINATION BOTTLE OPENER AND RESEALER
Garry E. Henshaw, 6616 St. Estaban, Tujunga, Calif. 91042
Filed Jan. 14, 1985, Ser. No. 691,413
Term of patent 14 years
U.S. Cl. D8—40



291,053
KNOB
Giorgio Decursu, Milan, Italy, assignor to Elesa S.p.A., Milan, Italy
Filed Jan. 30, 1984, Ser. No. 575,145
Claims priority, application Italy, Apr. 8, 1983, 22588/83[U]
Term of patent 14 years
U.S. Cl. D8—310



291,054
HINGE
Katsumi Niwa, 874-2, Nakagiri, Mitake-cho, Kani-gun, Gifu-ken, Japan
Filed Feb. 15, 1985, Ser. No. 702,310
Claims priority, application Japan, Sep. 19, 1984, 59-38939
Term of patent 14 years
U.S. Cl. D8—325



291,055
PANEL FASTENER OR SIMILAR ARTICLE
Kunihiro Fukuhara, and Masayuki Naruse, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan
Filed Feb. 10, 1986, Ser. No. 827,560
Term of patent 14 years
U.S. Cl. D8—354

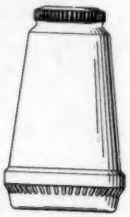
291,056
CIRCUIT BOARD SUPPORT
Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.
Filed May 24, 1985, Ser. No. 737,513
Term of patent 14 years
U.S. Cl. D8—354

291,057
PANEL FASTENER OR SIMILAR ARTICLE
Toshiyuki Shiraishi, Hiroshima, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Aug. 26, 1985, Ser. No. 769,848
Claims priority, application Japan, Mar. 2, 1985, 60-8258
Term of patent 14 years
U.S. Cl. D8—354

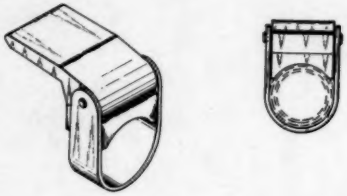
291,058
TIE FOR A BOAT GUNWALE
George C. Sorensen, P.O. Box 46754, Seattle, Wash. 98146
Filed Sep. 17, 1984, Ser. No. 651,697
Term of patent 14 years
U.S. Cl. D8—356

291,059
CASTER ASSEMBLY
Dale Mickelson, 829 Zurich Dr., Lake Arrowhead, Calif. 92317
Filed Apr. 12, 1984, Ser. No. 599,672
Term of patent 14 years
U.S. Cl. D8—375

291,060
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Feb. 25, 1985, Ser. No. 705,253
Term of patent 14 years
U.S. Cl. D9—389



291,061
TUBULAR LEG CLAMP
Koma Nakatani, Tokyo, Japan, assignor to Velbon International Corp., Torrance, Calif.
Filed Oct. 4, 1984, Ser. No. 657,510
Term of patent 14 years
U.S. Cl. D8—396

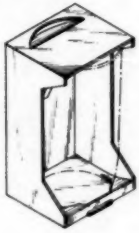


291,062
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Vercon, Inc., Dallas, Tex.
Filed Feb. 25, 1985, Ser. No. 705,250
Term of patent 14 years
U.S. Cl. D9—390

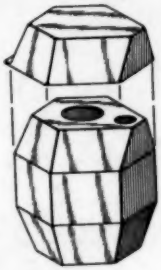
291,063
LUBRICANT CONTAINER
Anthony P. Prince, Waukegan; Richard P. Kolb, Gages Lake, both of Ill., and Myron T. Stevens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Aug. 30, 1984, Ser. No. 645,699
Term of patent 14 years
U.S. Cl. D9—401

291,064
PACKAGING CONTAINER FOR A TELEPHONE
Barry Haber, Westport, Conn., and Charles Walkley, East Brunswick, N.J., assignors to Conair Corporation, Edison, N.J.
Filed May 27, 1986, Ser. No. 867,398
Term of patent 14 years
U.S. Cl. D9—415

291,065
PACKAGING CONTAINER OR SIMILAR ARTICLE
Richard E. Pugh, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Jul. 12, 1984, Ser. No. 630,183
Term of patent 14 years
U.S. Cl. D9—418



291,066
PACKAGING CONTAINER
Jean-Luc Antoine, 12, rue de Petit Ban, 88000 Vittel, France
Filed Sep. 13, 1984, Ser. No. 650,048
Claims priority, application France, Mar. 22, 1984, 104
Term of patent 14 years
U.S. Cl. D9—418



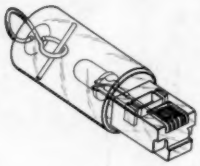
291,067
DISPENSING BOX FOR COTTONWOOL-TIPPED STICKS OR THE LIKE
Henri Minost, Neuilly S/Seine, France, assignor to Beghin-Say, S.A., Thumeries, France
Filed Oct. 1, 1984, Ser. No. 656,678
Claims priority, application France, Mar. 29, 1984, 84 1433
Term of patent 14 years
U.S. Cl. D9—418

291,068
SPORTS TIMER
Charles Jones, Hope; James L. Murphy, and Kenneth Burks, both of Little Rock, all of Ark., assignors to Sports Timer, Inc., North Little Rock, Ark.
Filed Jan. 8, 1985, Ser. No. 689,775
Term of patent 14 years
U.S. Cl. D10—30

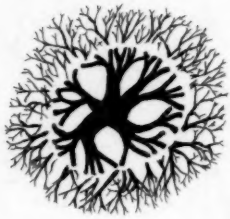
291,069
TIMER
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Mar. 11, 1985, Ser. No. 710,401
Term of patent 14 years
U.S. Cl. D10—40

291,070
CRIBBAGE BOARD
David E. Watson, 15 Ives St., Beverly, Mass. 01915
Filed Apr. 8, 1985, Ser. No. 720,918
Term of patent 14 years
U.S. Cl. D10—46.1

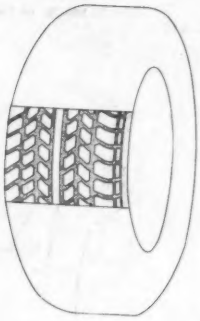
291,071
TELEPHONE LINE POLARITY TESTER
Randy J. Breil, 5352 Belle Ave., Cypress, Calif. 90630
Filed Mar. 28, 1985, Ser. No. 717,434
Term of patent 14 years
U.S. Cl. D10—78



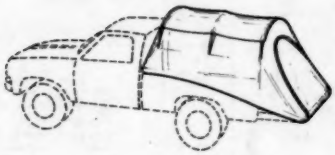
291,072
TREE SCULPTURE
Loney J. Hebert, Jr., P.O. Box 224, Opelousas, La. 70571
Filed Sep. 4, 1984, Ser. No. 646,506
Term of patent 14 years
U.S. Cl. D11—118



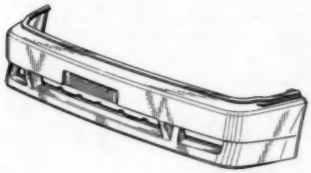
291,073
TIRE FOR A VEHICLE WHEEL
Romano Guermandi, Milan, Italy, assignor to Societa' Pneumatici Pirelli, Italy
Filed Aug. 27, 1984, Ser. No. 644,682
Claims priority, application Italy, Feb. 29, 1984, 21046/84[U]
Term of patent 14 years
U.S. Cl. D12—146



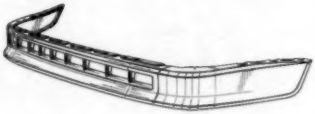
291,074
TRUCK TENT
Ronald R. Ravana, 1929 Montecito Dr., Glendale, Calif. 91208
Filed Oct. 11, 1985, Ser. No. 786,753
Term of patent 14 years
U.S. Cl. D12—156



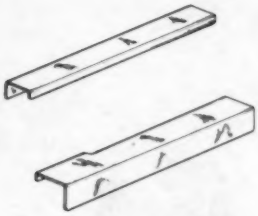
291,075
FRONT BUMPER FOR AN AUTOMOBILE
Seiichiro Kitahashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Dec. 10, 1985, Ser. No. 807,476
Claims priority, application Japan, Jul. 3, 1985, 60-28468
Term of patent 14 years
U.S. Cl. D12—169



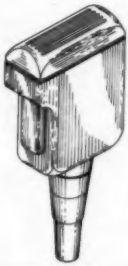
291,076
AIR SPOILER FOR A VEHICLE
Tsutomu Kawaguchi, and Yuji Ito, both of Toyota, Japan, assignors to Toyoda Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1985, Ser. No. 760,970
Term of patent 14 years
U.S. Cl. D12—181



291,077
PAIR OF AUTOMOTIVE STEP PLATES
Leroy O. Parno, 5747 E. Admiral Pl., Tulsa, Okla. 74115
Filed Oct. 24, 1983, Ser. No. 544,849
Term of patent 14 years
U.S. Cl. D12—203



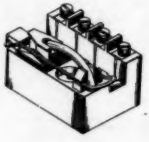
291,078
MICROPHONE OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, and Craig F. Siddoway, Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 4, 1985, Ser. No. 697,817
Term of patent 14 years
U.S. Cl. D14—12

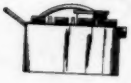


291,079
CAR SPEAKER
Tetsuo Ohtsuji, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Aug. 16, 1984, Ser. No. 641,155
Claims priority, application Japan, Feb. 21, 1984, 59-6280
Term of patent 14 years
U.S. Cl. D14—30

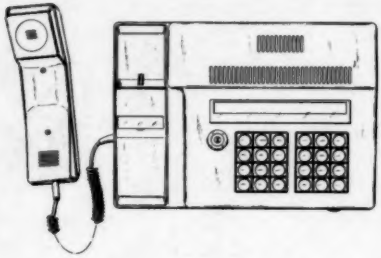
291,080
LOUDSPEAKER
Noboru Keitoku, and Akira Katsuno, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Nov. 16, 1984, Ser. No. 672,437
Claims priority, application Japan, Jun. 12, 1984, 59-24001
Term of patent 14 years
U.S. Cl. D14—30

291,081
TELEPHONE NETWORK INTERFACE DEVICE
N. Peter Mickelson, Gorham, and John J. Napiorkowski, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.
Filed Jan. 13, 1986, Ser. No. 818,144
Term of patent 14 years
U.S. Cl. D14—52





291,082
TELEPHONE SET
Karl Büchin, Berlin, Fed. Rep. of Germany, assignor to Krone GmbH, Berlin, Fed. Rep. of Germany
Filed Jul. 30, 1985, Ser. No. 760,584
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 95 MR 5423 NZ
Term of patent 14 years
U.S. Cl. D14—53

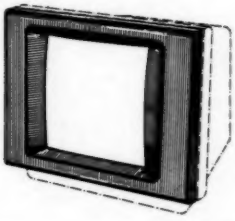


291,083
TELEPHONE HANDSET
Charles B. Davidson, Croton-on-Hudson, N.Y., assignor to AT&T Technologies, Inc. American Telephone & Telegraph Co., Murray Hill, N.J.
Filed Apr. 12, 1985, Ser. No. 722,540
Term of patent 14 years
U.S. Cl. D14—63

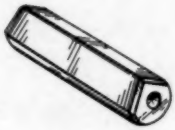
291,084
RADIO RECEIVER OR THE LIKE
Syuhei Taniguchi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 14, 1984, Ser. No. 650,492
Claims priority, application Japan, Apr. 3, 1984, 59-13077
Term of patent 14 years
U.S. Cl. D14—68

291,085
MONITOR
Michael J. Nuttall, Palo Alto; Diab E. Freige, Los Altos, and Leroy B. Keely, Portola Valley, all of Calif., assignors to Convergent Technologies, Inc., San Jose, Calif.
Filed May 9, 1984, Ser. No. 608,602
Term of patent 14 years
U.S. Cl. D14—113

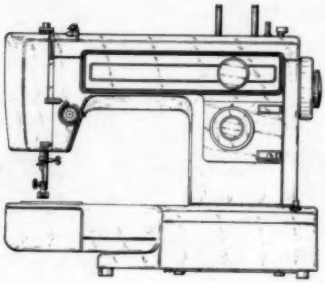
291,086
MONITOR BEZEL
John Price, Peabody, Mass., assignor to Xyvision, Inc., Woburn, Mass.
Filed May 18, 1984, Ser. No. 612,047
Term of patent 14 years
U.S. Cl. D14—115



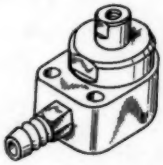
291,087
WEDGE FOR A DRILL SHANK OF A PERCUSSION DRILLING MACHINE
Pekka Salmi, Tampere, and Timo Muuttonen, Nokia, both of Finland, assignors to OY Tampella AB, Tampere, Finland
Filed Dec. 18, 1984, Ser. No. 683,259
Claims priority, application Finland, Jul. 3, 1984, 670/84
Term of patent 14 years
U.S. Cl. D15—21



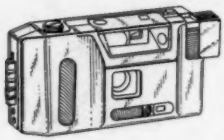
291,088
SEWING MACHINE
Susumu Hanyu, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Mar. 5, 1984, Ser. No. 586,095
The portion of the term of this patent subsequent to Jun. 9, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—69



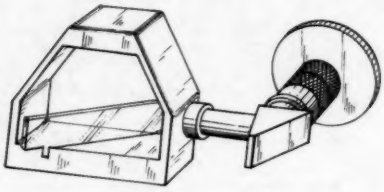
291,089
RAM FOR INDUSTRIAL ROBOTS OR THE LIKE
Yoji Ise, Tokyo, Japan, assignor to Myotoku Ltd., Tokyo, Japan
Filed Nov. 8, 1984, Ser. No. 669,291
Term of patent 14 years
U.S. Cl. D15—199



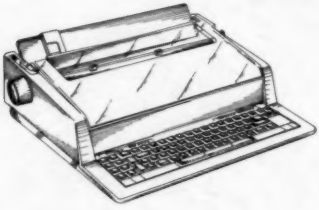
291,090
CAMERA
Nobuhiro Ago, and Takayuki Tsuboi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 22, 1985, Ser. No. 725,550
Claims priority, application Japan, Nov. 28, 1984, 59-48869
Term of patent 14 years
U.S. Cl. D16—6



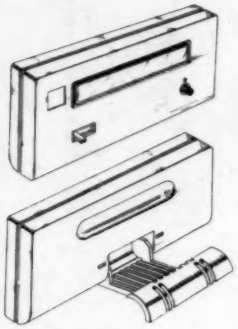
291,091
COMBINED BEAM SPLITTER AND OPTICAL COUPLER FOR CONNECTING A LIGHT SOURCE TO A TELEVISION CAMERA DURING SURGICAL PROCEDURES
Richard E. Feinbloom, New York, and Lung T. Yee, Brooklyn, both of N.Y., assignors to Designs for Vision, Inc., Ronkonkoma, N.Y.
Filed Feb. 6, 1984, Ser. No. 577,202
Term of patent 14 years
U.S. Cl. D16—130



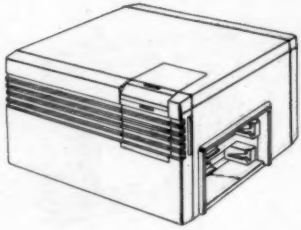
291,092
TYPEWRITER
Christoph Egli, Huddinge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed May 3, 1985, Ser. No. 730,339
Claims priority, application Sweden, Nov. 5, 1984, 84-2945
Term of patent 14 years
U.S. Cl. D18—1



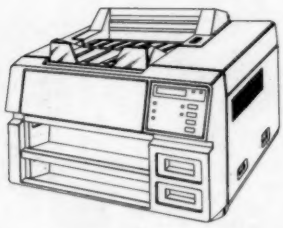
291,093
DISPLAY FOR ELECTRONIC TYPEWRITER OR SIMILAR ARTICLE
James P. Wang, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 19, 1984, Ser. No. 602,106
Term of patent 14 years
U.S. Cl. D18—12



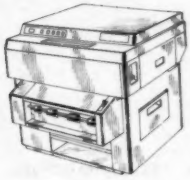
291,094
LASER PRINTER
Kenichi Nakade, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 20, 1985, Ser. No. 778,333
Claims priority, application Japan, Mar. 22, 1985, 60-11341
Term of patent 14 years
U.S. Cl. D18—13



291,095
LASER PRINTER
Kiyotaka Morozumi; Masanori Hashimoto, both of Kanagawa, and Masahiro Minagawa, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 20, 1985, Ser. No. 778,335
Claims priority, application Japan, Mar. 22, 1985, 60-11343
Term of patent 14 years
U.S. Cl. D18—13

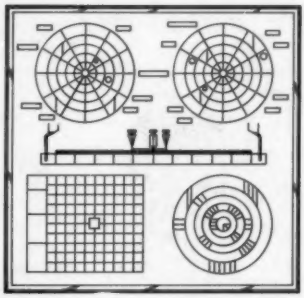


291,096
LASER BEAM PRINTER
Takashi Yomo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 8, 1985, Ser. No. 804,740
Claims priority, application Japan, May 11, 1985, 60-19486
Term of patent 14 years
U.S. Cl. D18—13

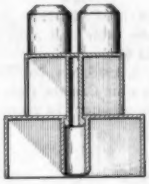


291,097
DISPLAY PANEL FOR SHELVING
Gary L. Dalbey, Ankeny, and Ronald L. Huston, Altoona, both of Iowa, assignors to Hulsizer's, Inc., Ankeny, Iowa
Filed Oct. 17, 1984, Ser. No. 661,604
Term of patent 14 years
U.S. Cl. D20—44

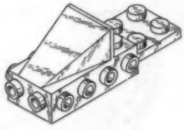
291,098
DART FOOTBALL GAMEBOARD
Timothy M. O'Connor, 1017 Hall Ave., West St. Paul, Minn. 55118
Filed Feb. 11, 1985, Ser. No. 700,659
Term of patent 14 years
U.S. Cl. D21—6



291,099
TOY CONSTRUCTION PIECE
Vic Bertrand, 89 Woodlawn, Dollard des Ormeaux (Quebec), Canada H9A 1Z3, assignor to The Ritvik Group Inc., Dorval, Canada
Filed Dec. 2, 1985, Ser. No. 803,478
Term of patent 14 years
U.S. Cl. D21—108

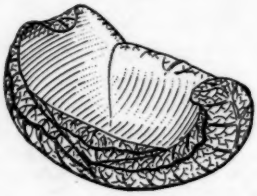


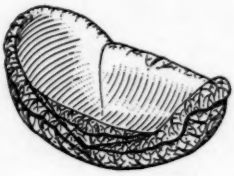
291,100
TOY BUILDING BLOCK
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1985, Ser. No. 805,192
Term of patent 14 years
U.S. Cl. D21—108



291,101
TOY CONSTRUCTION PIECE
Jens N. Knudsen, and Daniel A. Krentz, both of Billund, Denmark, assignors to Interlego A.G., Baar, Switzerland
Filed Dec. 4, 1985, Ser. No. 805,194
Term of patent 14 years
U.S. Cl. D21—108

291,102
DOLL CARRIER
Brigitte C. Marshall, 660 Briar Hill Ave., Apt. 502, Toronto, Ontario, Canada M6B 4B7
Filed May 6, 1985, Ser. No. 731,162
Claims priority, application Canada, Dec. 3, 1984, 03-12-84-9
Term of patent 14 years
U.S. Cl. D21—121





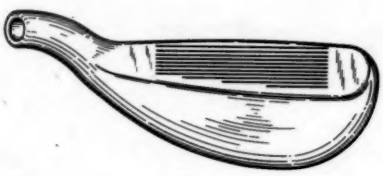
291,103
TOY PONY
Elizabeth Knight, Milton, Mass., assignor to Hasbro Industries, Inc., Pawtucket, R.I.
Continuation of Ser. No. 549,905, Nov. 7, 1983, and Ser. No. 549,907, Nov. 7, 1983. This application Jun. 14, 1986, Ser. No. 875,231
Term of patent 14 years
U.S. Cl. D21—165

291,104
GIRL CLOWN RAG DOLL
Betty L. Koester, R.R. 1, Box 232, Poseyville, Ind. 47633, and Janet F. Adler, R.R. 2, Box 219, Haubstadt, Ind. 47639
Filed Feb. 15, 1985, Ser. No. 702,178
Term of patent 14 years
U.S. Cl. D21—173

291,105
DOLL HEAD
Katherine M. Ehrenfried, R.R. #1, Box 191, Beecher, Ill. 60401
Filed Feb. 11, 1985, Ser. No. 700,822
Term of patent 14 years
U.S. Cl. D21—190

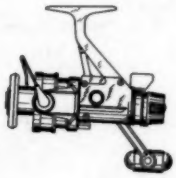
291,106
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Sep. 24, 1984, Ser. No. 653,534
Term of patent 14 years
U.S. Cl. D21—219

291,107
GOLF CLUB HEAD
Robert A. Mendralla, Wheeling, and Carl E. Scheie, Libertyville, both of Ill., assignors to Wilson Sporting Goods Co., River Grove, Ill.
Filed Jan. 4, 1985, Ser. No. 688,647
Term of patent 14 years
U.S. Cl. D21—220

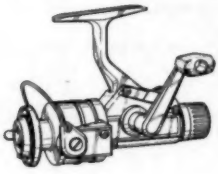


291,108
FISHING REEL
Richard J. Robbins, Derby, Kans., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jul. 30, 1984, Ser. No. 635,447
Term of patent 14 years
U.S. Cl. D22—141

291,109
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Oct. 17, 1984, Ser. No. 661,960
Claims priority, application Japan, Apr. 24, 1984, 59-16685
Term of patent 14 years
U.S. Cl. D22—141

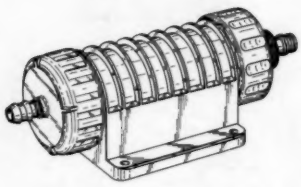


291,110
FISHING REEL
Takeshi Shohoji, and Masakazu Sakamoto, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 4, 1984, Ser. No. 678,184
Claims priority, application Japan, Jun. 18, 1984, 59-25212
Term of patent 14 years
U.S. Cl. D22—141



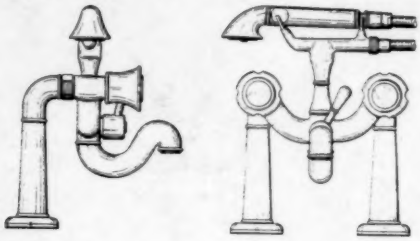
291,111
TANK FOR PRESSURE FEEDING OF PAINT OR OTHER LIQUIDS
Richard A. Linn, Minneapolis, Minn., assignor to Padco, Inc., Minneapolis, Minn.
Filed Feb. 8, 1985, Ser. No. 699,733
Term of patent 14 years
U.S. Cl. D23—2

291,112
COMBINED PRESSURE REDUCER AND FERTILIZER DISPENSER
Clivio: Franco, Zürich, Switzerland, and Dieter Raffler, Neu-Ulm, Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Oct. 3, 1984, Ser. No. 657,410
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, GRAIII730/8403
Term of patent 14 years
U.S. Cl. D23—3

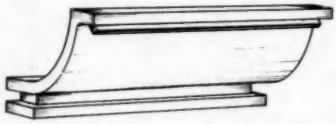


291,113
SPRAY GUN
Horst Bauer, Frankenthal, Fed. Rep. of Germany, assignor to Carl Platz GmbH, Frankenthal, Fed. Rep. of Germany
Filed Jan. 17, 1985, Ser. No. 692,783
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 1055
Term of patent 14 years
U.S. Cl. D23—17

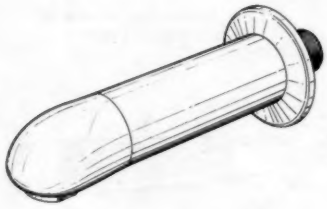
291,114
COMBINED BATHTUB FAUCET AND HAND SHOWER
Nazzareno Piesco, Milan, Italy, assignor to F.I.R. Rubinetterie S.p.A., Italy
Filed May 7, 1985, Ser. No. 731,242
Claims priority, application Italy, Nov. 7, 1984, 23700/84[U]
Term of patent 14 years
U.S. Cl. D23—25



291,115
SPOUT
Jean-Claude Delepine, 23 Rue de Clapeyron, 75008, Paris, France
Filed Dec. 20, 1984, Ser. No. 686,026
Claims priority, application France, Jun. 29, 1984, 84 2925
Term of patent 14 years
U.S. Cl. D23—32

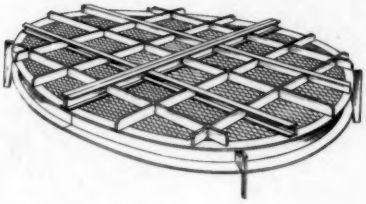


291,116
SPOUT
Andreas Haug, Altensteig, and Thomas Schönherr, Egenhausen, both of Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co KG, Fed. Rep. of Germany
Filed Sep. 4, 1985, Ser. No. 772,355
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, MR 1158 0B
Term of patent 14 years
U.S. Cl. D23—32

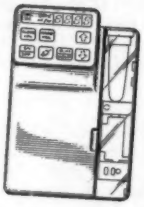


291,117
FAUCET SPOUT
Thomas J. Ryan, San Diego, Calif., assignor to Masco Building Products Corp., Taylor, Mich.
Filed Oct. 17, 1985, Ser. No. 788,345
Term of patent 14 years
U.S. Cl. D23—32

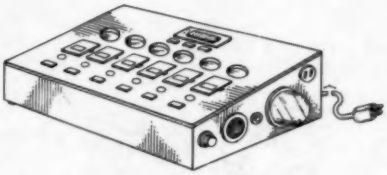
291,118
COVER FOR A LADLE OR THE LIKE
Thomas M. Miller, North Olmsted, and Raymond J. Schraff, Cleveland, both of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.
Filed Oct. 2, 1984, Ser. No. 656,829
Term of patent 14 years
U.S. Cl. D23—82



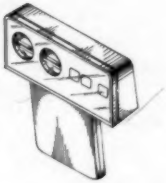
291,119
ENTERIC PUMP
Bruce R. Campbell, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Jun. 8, 1984, Ser. No. 618,884
Term of patent 14 years
U.S. Cl. D24—8



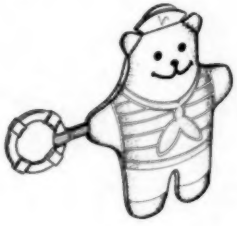
291,120
TIMED MEDICATION DISPENSER
Donna Schuster, 443 Roberts, Reno, Nev. 89450
Filed Jan. 14, 1985, Ser. No. 691,184
Term of patent 14 years
U.S. Cl. D24—8



291,121
INTERFACING CASSETTE FOR USE WITH A DEFIBRILLATOR OR THE LIKE
Paul W. Jones, Issaquah, and Casey M. Bardue, Seattle, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Jan. 8, 1985, Ser. No. 689,745
Term of patent 14 years
U.S. Cl. D24—17

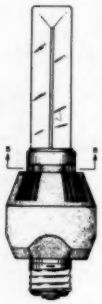


291,122
TEETHING TOY
Lawrence B. Grubb, Monkton, Md., and Lois E. Kelly, Brooklyn, N.Y., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Jul. 16, 1984, Ser. No. 631,274
Term of patent 14 years
U.S. Cl. D24—45

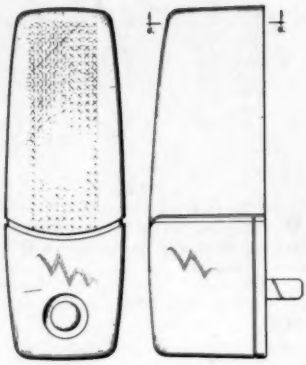


291,123
CONTROL PANEL FOR A CONTROL VALVE FOR USE WITH A TOURNIQUET SYSTEM
William L. McCune, Denver, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.
Filed Aug. 23, 1983, Ser. No. 525,756
Term of patent 14 years
U.S. Cl. D24—21

291,124
FLUORESCENT LAMP OR THE LIKE
Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Apr. 12, 1985, Ser. No. 722,963
Term of patent 14 years
U.S. Cl. D26—3



291,125
NIGHT-LIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Apr. 18, 1985, Ser. No. 724,537
Term of patent 14 years
U.S. Cl. D26—26

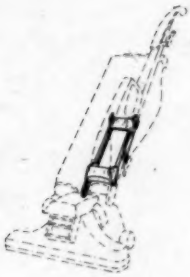


291,126
COMBINED CIGARETTE SNUFFER AND HOLDER
Ingrid E. Gaptjern, 242 Farrwood Dr., Bradford, Mass. 01830
Filed Dec. 3, 1985, Ser. No. 804,298
Term of patent 14 years
U.S. Cl. D27—2

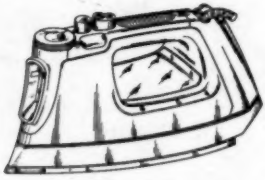
291,127
PROTECTIVE HELMET WITH RETRACTABLE GOGGLES
Bengt Bohjort, Enkoping, Sweden, assignor to Miniman Security AB, Enkoping, Sweden
Filed Aug. 30, 1984, Ser. No. 645,757
Claims priority, application Sweden, Mar. 6, 1984, 84-0765
Term of patent 14 years
U.S. Cl. D29—15

291,128
JOCKEY HELMET
Barbara S. Grandsart, 347 Helois, Metairie, La. 70005
Filed Mar. 15, 1985, Ser. No. 712,139
Term of patent 14 years
U.S. Cl. D29—15

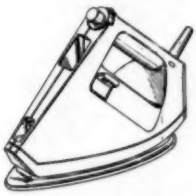
291,129
VACUUM CLEANER BRACKET
John R. Lackner, North Ridgeville, and William E. Bartasevich, Jr., Kent, both of Ohio, assignors to The Scott & Fetzer Company, Westlake, Ohio
Filed May 9, 1985, Ser. No. 732,433
Term of patent 14 years
U.S. Cl. D32—31



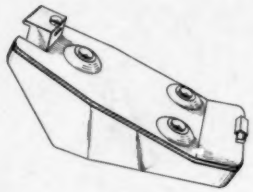
291,130
ELECTRIC IRON
Serge Brun, Lyons, France, assignor to Calor S.A., Lyons, France
Filed Jun. 11, 1985, Ser. No. 743,653
Claims priority, application France, Dec. 19, 1984, 84 5720
Term of patent 14 years
U.S. Cl. D32—70



291,131
PRESSING IRON
Michael N. Komar, Manchester, England, assignor to TI Russell Hobbs Limited, Stoke-on-Trent, England
Filed Mar. 4, 1985, Ser. No. 707,541
Claims priority, application United Kingdom, Oct. 16, 1984, 1022713
Term of patent 14 years
U.S. Cl. D32—70



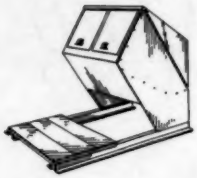
291,132
STAND FOR A PRESSING IRON
Michael N. Komar, Manchester, England, assignor to TI Russell Hobbs Limited, Stoke-on-Trent, England
Filed Mar. 4, 1985, Ser. No. 707,540
Claims priority, application United Kingdom, Oct. 16, 1984, 1022714
Term of patent 14 years
U.S. Cl. D32—73



291,133
LEAF AND CUTTINGS GATHERER
Paul Disanza, 18 Homestead Pl., Bergenfield, N.J. 07621
Filed May 2, 1984, Ser. No. 606,142
Term of patent 14 years
U.S. Cl. D34—1

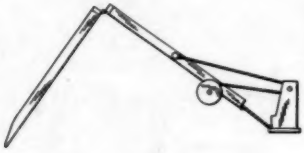
291,134
REFUSE CONTAINER
Robert A. DeMars, 7932 Maestro St., Canaga Park, Calif. 91304
Filed Aug. 8, 1985, Ser. No. 763,629
Term of patent 14 years
U.S. Cl. D34—5

291,135
REFUSE CONTAINER
Dennis Neufeldt, Coaldale, Canada, assignor to Neufeldt Industries Limited, Lethbridge, Canada
Filed Jul. 6, 1984, Ser. No. 628,489
Claims priority, application Canada, Jan. 11, 1984, 11-01-84-3
Term of patent 14 years
U.S. Cl. D34—8



291,136
TRANSPORTING DEVICE
Krister Andersson, Skolgatan 12, S-82400 Hudiksvall, Sweden
Filed Oct. 19, 1984, Ser. No. 662,901
Claims priority, application Sweden, May 29, 1984, 84-1652
Term of patent 14 years
U.S. Cl. D34—28

291,137
FOLDING RAMP
Fred C. Malara, 20 Preston St., Middletown, N.Y. 10940
Filed Nov. 12, 1985, Ser. No. 804,733
Term of patent 14 years
U.S. Cl. D34—32

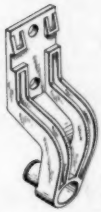


291,138

BRACKET FOR USE IN A TROLLEY MEMBER

Ingemar Ärneteg, Vretstorp, Sweden, assignor to Stellana Plast AB, Laxa, Sweden

Filed Sep. 18, 1984, Ser. No. 652,149
Claims priority, application Sweden, Mar. 23, 1984, 84-0983
Term of patent 14 years
U.S. Cl. D34—35

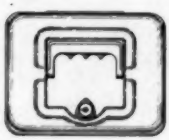


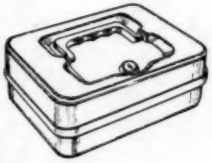
291,139

CASH BOX

Clive W. Warwicker, Cookley, Nr. Kidderminster, England, assignor to Helix Limited, West Midlands, England

Filed Sep. 7, 1984, Ser. No. 648,462
Claims priority, application United Kingdom, Mar. 10, 1984, 1018422
Term of patent 14 years
U.S. Cl. D99—28





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PATENTS WERE ISSUED ON THE 28TH DAY OF JULY, 1987

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Palau, Joseph; and Bassi, Dario, 4,682,634, Cl. 139-85.000.
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Betts, William L.; and Zuranski, Edward S., to Paradyne Corporation. Automatic gain control using the extreme points of a constellation. 4,683,578, Cl. 375-98.000.
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Kessler, Ronald N.; and Ullman, Myron E., 4,682,704, Cl. 215-329.000.

Bode, Daniel, to Glidden Company, The. Polyester and epoxy resin coating. 4,683,273, Cl. 523-412.000.

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Boillat, Pierre, to Sodeco-Saida AG. Stabilizing arrangement for a stepping motor. 4,683,409, Cl. 318-696.000.

Boivin, Richard F.; Huni, Jean-Paul R.; and Potocnik, Vinko, to Alcan International Limited. Busbar arrangement for aluminium electrolytic cells. 4,683,047, Cl. 204-243.00M.

Bolton, John D. Easy clear spray nozzle. 4,682,731, Cl. 239-119.000.

Boney, Joel F., to Motorola, Inc. Floating point condition code generation. 4,683,546, Cl. 364-748.000.

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Van Geenen, Albert A.; and Bongers, Jozef J. M., 4,683,304, Cl. 540-529.000.

Borg-Warner Corporation: *See*—
Durum, Metin M., 4,683,427, Cl. 324-207.000.

Borton, David N.: *See*—
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Bourdon, Claude: *See*—
Taylor, Frank S.; and Bourdon, Claude, 4,682,432, Cl. 40-573.000.

Bouwman, George J.: *See*—
Cutright, Robert A.; Briggs, Mark W.; and Bouwman, George J., 4,683,424, Cl. 324-158.00F.

Boyes, Russell S.: *See*—
Moran, James J.; and Boyes, Russell S., 4,683,152, Cl. 427-428.000.

Brady, William J.; and Anderson, Harlan U. Method and composition for producing hard surface carbide insert tools. 4,682,987, Cl. 51-293.000.

Bramblett, Earl C.; and Clem, Warren E. Can crusher. 4,682,539, Cl. 100-265.000.

Brand, Jerry D.: *See*—
Oyler, John F.; Brand, Jerry D.; and Zavada, Richard, 4,683,029, Cl. 196-14.520.

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Majthan, Rudolf, 4,683,155, Cl. 428-35.000.

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Braun, Hilarion; and Bray, Fletcher, 4,683,477, Cl. 346-75.000.

Brecht, Gerhard; and Sackmann, Dieter, to Marabuwerke Erwin Martz GmbH & Co. Electronic carriage brake for a drawing machine. 4,682,822, Cl. 303-20.000.

Brenish, Michael; and Herzig, Frank. Combination joint raker and jointer. 4,682,383, Cl. 15-105.500.

Bretthauer, Karlheinz; and Obenauf, Hans-Dietrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method and apparatus for regulating arc discharge furnace. 4,683,577, Cl. 373-105.000.

Brewster, Phillip W.; Smith, Clinton R.; and Gowland, Frederick W., to Exxon Research & Engineering Co. Glycerol esters as fuel economy additives. 4,683,069, Cl. 252-32.70E.

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Bridgestone Corporation: *See*—
Kakiuchi, Shinichi; Saito, Tasuku; and Tomita, Seisuke, 4,683,257, Cl. 524-432.000.
Watanabe, Tadashi; and Inoue, Shunichi, 4,682,641, Cl. 157-13.000.

Bridgestone Cycle Co., Ltd.: *See*—
Takamiya, Kikuzo; and Hideyuki, Ishibashi, 4,682,509, Cl. 74-551.400.

Briese, Leonard A. Cutting insert arrangement. 4,682,916, Cl. 407-113.000.

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Kelch, Russell K.; Finfrock, Don C.; Girard, Donald J.; Seevers, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., 4,683,531, Cl. 364-200.000.

Briggs, Mark W.: *See*—
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Tsunakawa, Mitsuaki; Konishi, Masataka; and Miyaki, Takeo, 4,683,230, Cl. 314-214.000.
Ueda, Yasutsugu; and Roberge, Guy, 4,683,296, Cl. 539-558.000.

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Britt, Thomas R.; and Burton, Willie C., to Dow Chemical Company, The. Process for preparing substituted bis-ethers. 4,683,333, Cl. 564-414.000.

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Brock, Thorsten, to U.S. Philips Corporation. Circuit arrangement for distinguishing between the two fields in a television signal. 4,683,495, Cl. 358-148.000.

Broer, Dirk J.; Zwiers, Renso J. M.; and Jochem, Cornelis M. G., to U.S. Philips Corporation. Transmission projection screen and method of manufacturing same. 4,682,853, Cl. 350-128.000.

Broersz, Gerrit, to Meade, John. Underwater scouring apparatus. 4,682,558, Cl. 114-222.000.

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Onoda, Hiroshi; and Mizuno, Kenji, 4,682,902, Cl. 400-18.000.

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Langpape, Reinhart; Dorrscheidt, Wolfgang; Roze, Jean-Philippe; and Steinleitner, Gunther, 4,683,179, Cl. 429-104.000.

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Baro, Gunter; Kraus, Werner; and Stindt, Wilfried, 4,683,107, Cl. 376-260.000.
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Waltemyer, Ronald G.; and Brown, Royce L., 4,682,467, Cl. 59-30.000.

Brown, Winthrop K.: *See*—
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Brumke, Ernst-Joachim; and Struwe, Hartmut, to Dragoco Gerberding and Co. GmbH. Mixtures of tricyclo-decane-derivatives together with their preparation and use are perfuming- and flavoring materials. 4,683,083, Cl. 252-522.00R.

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Bryce, J. Robert, to Crane Electronics, Inc. Multi-row modular electrical connector. 4,682,839, Cl. 439-598.000.

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Buchanan, Michael S.: *See*—
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Bucher, James D., II, to Zytec Corporation. Switching power supply with automatic power factor correction. 4,683,529, Cl. 363-44.000.

Budde, Frederik J., to Akzo nv. Process for the recovery of ethylene amines from an aqueous solution. 4,683,337, Cl. 564-498.000.

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Schnegg, Julius, 4,682,480, Cl. 66-192.000.

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Burnham, Stephen R.; and Lillis, William J., 4,683,483, Cl. 357-13.000.
Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., 4,683,550, Cl. 364-900.000.

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Lake, Ralph J., Jr.; Stern, Timothy R.; Sudol, George A.; and Selepouchin, Vladimir, 4,683,465, Cl. 340-700.000.

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Gabuzda, Paul G., 4,682,651, Cl. 165-80.300.

Burton, John H.; and Staehle, Brad G. Inflatable artificial sphincter. 4,682,583, Cl. 128-1.00R.

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Butt, Sheldon H., to Olin Corporation. Multi-layer circuitry. 4,682,414, Cl. 29-840.000.

Buxton, Frank A.; and Barraclough, David J., to Rolls-Royce plc. Moulding of composite materials. 4,683,099, Cl. 264-511.000.

Buxton, Gerald W., to Paper Converting Machine Company. Apparatus for folding spaced segments of web material. 4,682,977, Cl. 493-358.000.

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Lewis, Victor M.; and Lewis, David A., 4,683,141, Cl. 426-639.000.

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Callender, Robert J. Garment connector. 4,682,389, Cl. 24-599.000.

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Camm, David M., to Fusion Systems Corporation. Lamp having segmented reflector. 4,683,525, Cl. 362-346.000.

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Kemp, Charles W., 4,682,664, Cl. 177-16.000.

Cann, Gordon L. Magnetoplasmadynamic processor, applications thereof and methods. 4,682,564, Cl. 118-620.000.

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Eguchi, Ken; Matsuda, Hiroshi; Haruta, Masahiro; Nishimura, Yukuo; Hirai, Yutaka; and Nakagiri, Takashi, 4,683,147, Cl. 427-54.100.
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McManus, John R., 4,682,488, Cl. 72-387.000.

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Cascade Corporation: *See*—
House, Marshall K., 4,682,931, Cl. 414-623.000.

Casey, Daniel T., to AMP Incorporated. Terminating apparatus. 4,682,400, Cl. 29-564.700.
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Castor, Raymond A.: *See*—
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Tupman, David J., 4,683,373, Cl. 250-221.000.
Cates, Robert E., to Baltimore Aircoil Company, Inc. Cross flow evaporative coil fluid cooling apparatus and method of cooling. 4,683,101, Cl. 261-146.000.
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Mullis, Kary B.; Erlich, Henry A.; Arnheim, Norman; Horn, Glenn T.; Saiki, Randall K.; and Scharf, Stephen J., 4,683,195, Cl. 435-6.000.
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Chaix, Jean E.: *See*—
Badoux, Jean-Paul; Chaix, Jean E.; and Metteey, Michel, 4,683,112, Cl. 376-402.000.
Chambers, Sam W.; Spencer, Charles R.; and Miller, Wade E., to Morrison-Knudsen Company, Inc. Ceiling panel placing machine. 4,682,926, Cl. 414-11.000.
Chang, Kuang-Yeh: *See*—
Lee, William W. Y.; and Chang, Kuang-Yeh, 4,683,488, Cl. 357-42.000.
Chang, Shien F. Grinding mill. 4,682,738, Cl. 241-56.000.
Chang, Shih-Jeh; Emery, Richard T.; and Hakim, Shafik J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Directory number translation in a distributed control switching system. 4,683,584, Cl. 379-269.000.
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Gaget, Pierre, 4,682,423, Cl. 34-58.000.
Charles C. Lucas. Gun rack. 4,682,720, Cl. 224-311.000.
Chatterjee, Pallab K., to Texas Instruments Incorporated. dRAM cell and array. 4,683,486, Cl. 357-23.600.
Chavdarian, Charles G., to Stauffer Chemical Company. O-(substituted) benzyl dithiophosphonate insecticides. 4,683,225, Cl. 514-128.000.
Chawla, Surendra K., to Goodyear Tire & Rubber Company, The. Method and apparatus for speckle-shearing interferometric deformation analysis. 4,682,892, Cl. 356-353.000.
Cheng, Chin S., to Wilson Foods Corporation. Process for prepacking fresh meat. 4,683,139, Cl. 426-265.000.
Chisari, Frank: *See*—
Milich, David; and Chisari, Frank, 4,683,136, Cl. 424-89.000.
Chisso Corporation: *See*—
Sugimori, Shigeru; Goto, Yasuyuki; and Ogawa, Tetsuya, 4,683,078, Cl. 252-299.610.
Chiu-Rong, Wuu. Portable cigarette safety ash tube and extinguisher. 4,682,611, Cl. 131-256.000.
Cho, Hidetsura; Aisaka, Kazuo; Sato, Fumio; and Ishihara, Takafumi, to Suntory Limited. 2,6-Dimethyl-3N,5-disubstituted-4-(substituted phenyl)3,4-dihydropyrimidine compounds and a method for treating disorders of cardiocircular system. 4,683,234, Cl. 514-256.000.
Chovich, Milija M. Projectile. 4,682,546, Cl. 102-529.000.
Choy, Terrence A.; and Hartleben, Harold A., to Mattel, Inc. Reconfigurable vehicle-robot toy. 4,682,969, Cl. 446-279.000.
Christe, Karl O., to Rockwell International Corporation. Process for the production of advanced NF_4^+ salts. 4,683,129, Cl. 423-351.000.
Christenson, Roger M.: *See*—
Palermo, Anthony C.; Christenson, Roger M.; and Mazza, Glenn L., 4,683,266, Cl. 525-123.000.
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Christopher, Gilman G. Springloaded shutoff valve apparatus. 4,682,625, Cl. 137-538.000.
Ciba-Geigy Corporation: *See*—
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Ciccia, Lawrence P.: *See*—
Herdeg, Donald F.; and Ciccia, Lawrence P., 4,682,552, Cl. 112-121.120.
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Ciez, Albert P.: *See*—
Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., 4,683,365, Cl. 219-121.0LC.
Cii Honeywell Bull (Societe Anonyme): *See*—
Mollier, Jean, 4,683,553, Cl. 380-4.000.
Clairol Incorporated: *See*—
Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, 4,682,689, Cl. 206-222.000.
Clapp, Clarence, to Microcare Chemical Corporation. Pressurized fluid remote-dispenser and assembly including the same. 4,682,713, Cl. 222-153.000.
Clarion Co., Ltd.: *See*—
Mitsutsuka, Syuichi, 4,683,395, Cl. 310-313.00R.
Clark Equipment Company: *See*—
Tamas, Attila J., 4,682,751, Cl. 248-503.000.
Clark, John A.: *See*—
Vriens, Leendert; Clark, John A.; and Spruit, Johannes H. M., 4,683,398, Cl. 313-474.000.
Clark, Michael, to Dunlop Limited. Vibration absorbing mountings. 4,682,753, Cl. 248-562.000.
Clark, Roger T., to Pennwalt Corporation. Purification of organosulfonyl halides. 4,683,090, Cl. 260-543.00R.
Clasen, Rolf, to U.S. Philips Corporation. Method for the manufacture of glass bodies by extrusion. 4,682,995, Cl. 65-18.100.
Clem, Warren E.: *See*—
Bramblett, Earl C.; and Clem, Warren E., 4,682,539, Cl. 100-265.000.
Clift, Miner; and Engelhardt, Bill. Reverse-buckling rupture disk. 4,682,619, Cl. 137-68.100.
Cobb, Raymond L., to Phillips Petroleum Company. Purification of iodine-containing mixtures and compositions useful therefor. 4,683,033, Cl. 203-38.000.
Coca-Cola Company, The: *See*—
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 4,682,709, Cl. 221-2.000.
Credle, William S., Jr., 4,682,937, Cl. 417-393.000.
Cochran, Gary L.: *See*—
Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., 4,682,666, Cl. 180-89.130.
Coggins, Leroy; Murphy, Brian R.; Holmes, Dorothy F.; Anguish, Lynne J.; and Gillespie, James H., to Cornell Research Foundation, Inc. Temperature sensitive reassortant viruses and a vaccine against equine influenza. 4,683,137, Cl. 424-89.000.
Cohen, Melvin. Carpet sample display device. 4,682,697, Cl. 211-45.000.
Cohen, Sidney M., to Fuller Company. Method and apparatus for producing cement clinker including white cement. 4,682,948, Cl. 432-58.000.
Coleco Industries, Inc.: *See*—
Droller, Richard; and Farrington, Richard I., 4,682,968, Cl. 446-268.000.
Dubois, Craig; and Fontaine, Brian, 4,682,970, Cl. 446-309.000.
Coleman Company, Inc., The: *See*—
Zwick, David J., 4,682,618, Cl. 135-89.000.
Colgate-Palmolive Company: *See*—
Steltenkamp, Robert J.; and Camara, Michael A., 4,682,982, Cl. 8-137.000.
Coli, Giuseppe: *See*—
Carena, Ugo; Coli, Giuseppe; and Fogaroli, Giuseppe, 4,683,501, Cl. 358-293.000.
Collins, Paul W.; and Gasiecki, Alan F., to G. D. Searle & Co. Tetraenyl prostaglandins. 4,683,328, Cl. 560-118.000.
Collis, Raymond D.: *See*—
Lieb, M. Jeremy; and Collis, Raymond D., 4,682,560, Cl. 114-343.000.
Colorcon, Inc.: *See*—
Porter, Stuart C.; and Woznicki, Edward J., 4,683,256, Cl. 524-285.000.
Comau S.p.A.: *See*—
Bossotto, Piero; and Brandino, Mario, 4,682,722, Cl. 228-41.000.
Combustion Engineering, Inc.: *See*—
Schukei, Glen E., 4,682,630, Cl. 138-89.000.
Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energie, Nucleare e delle Energie Alternative - ENEA: *See*—
Armandillo, Errico; Salvetti, Gianemilio; and Giuliani, Giampiero, 4,682,893, Cl. 356-356.000.
Commercial Shearing, Inc.: *See*—
Petro, John D., 4,682,939, Cl. 418-178.000.
Commissariat A L'Energie Atomique: *See*—
Badoux, Jean-Paul; Chaix, Jean E.; and Metteey, Michel, 4,683,112, Cl. 376-402.000.
Hartmann, Joel; and Jeuch, Pierre, 4,682,403, Cl. 29-571.000.
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Duchet, Christian; and Martin, Rene , 4,683,448, Cl. 332-7.510.
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Cantello, Giuseppe; and Concari, Severino, 4,683,504, Cl. 360-78.000.
Concordia, Joseph J.; and Hall, Donald R., to Herzog-Hart Corporation. Gas-liquid reactor and method for gas-liquid mixing. 4,683,122, Cl. 422-227.000.
Conigliaro, Anthony; St. Hilaire, Arthur; and De Yoreo, Sal G., to Armatron International, Inc. Shredder for leaves and other like yard and garden refuse. 4,682,740, Cl. 241-282.100.
Conley, William F.: *See*—
Berger, Robert E.; Crossman, Richard L.; and Conley, William F., 4,682,640, Cl. 152-405.000.
Connor, Lee: *See*—
Jordan, Chalmer; Connor, Lee; and Lybarger, Robert, 4,682,381, Cl. 10-63.000.

Constantin, Emile J.; and Gryglas, Stephen, to Constantin Systems, Inc. Thermal management system for an episcopic image projector. 4,682,868, Cl. 353-58.000.

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Constantin, Emile J.; and Gryglas, Stephen, 4,682,868, Cl. 353-58.000.

Contact Securite - Societe d'Exploitation: *See*—
Zarka, Michel, 4,682,810, Cl. 296-20.000.

Contardo, Remo: *See*—
Aujla, Sharanjit S.; Debortoli, George; and Contardo, Remo, 4,682,835, Cl. 439-395.000.

Control Data Corporation: *See*—
Harte, Kenneth J.; and Langner, Guenther O., 4,683,366, Cl. 219-121.0ER.

Cook, Kenneth G., to M-O Valve Company Limited, The. Surge voltage protective circuit arrangements. 4,683,514, Cl. 361-91.000.

Cook, Richard C. Cryptographic process and enciphered product. 4,682,954, Cl. 380-154.000.

Cook, Robert C.; and Toeg, Sasson, to Securitron-Magnalock Corp. Electromagnet access control circuit. 4,682,801, Cl. 292-251.500.

Cookerly, Jack C.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,682,526, Cl. 84-1.030.

Cooper, Frank W., Jr.; and Dailey, George F., to Westinghouse Electric Corp. Debris removal system for a nuclear fuel assembly. 4,683,109, Cl. 376-261.000.

Cooper, Graham H. B.; and Williams, John A., to Supergas Ltd. Manifolding systems for gas containers. 4,682,627, Cl. 137-372.000.

Cooper Industries: *See*—
Hitchcock, William H., 4,683,404, Cl. 315-289.000.

Cooper Industries, Inc.: *See*—
Waltemyer, Ronald G.; and Brown, Royce L., 4,682,467, Cl. 59-30.000.

Cooper, John F.: *See*—
Goldstein, Amnon; and Cooper, John F., 4,683,187, Cl. 430-106.600.

Cooper, Martin H.: *See*—
Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., 4,683,365. Cl. 219-121.0LC.

Copen, Robert L.: *See*—
Harth, George H., III; Zolton, Gregory P., II; and Copen, Robert L., 4,682,397, Cl. 29-407.000.

Corbin, David R.: *See*—
Bergna, Horacio E.; Corbin, David R.; and Sonnichsen, George, 4,683,334, Cl. 564-474.000.

Cordis Corporation: *See*—
Bales, Thomas O.; and Smith, Kevin W., 4,682,596, Cl. 128-303.140.

Corelli, David A.: *See*—
Adelman, Roger A.; and Corelli, David A., 4,682,490, Cl. 73-12.000.

Corkery, Gregory O. C., to Arundale, Inc. Support roller. 4,682,393, Cl. 29-130.000.

Cornell Research Foundation, Inc.: *See*—
Coggins, Leroy; Murphy, Brian R.; Holmes, Dorothy F.; Anguish, Lynne J.; and Gillespie, James H., 4,683,137, Cl. 424-89.000.

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Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Francoise M. M.; Themont, Jean-Pierre; and Vachet, Andre J., 4,683,153, Cl. 428-1.000.
Hares, George B.; and Morse, David L., 4,683,168, Cl. 428-335.000.

Costar Corporation: *See*—
Lyman, George F.; and Mathus, Gregory, 4,683,058, Cl. 210-359.000.

Costello, David, to Texas A&M University. Fiber optic probe for quantification of colorimetric reactions. 4,682,895, Cl. 356-402.000.

Cotton, Leonard; Nay, Barry; and Wilcox, Michael J. Process for production of a syngas conversion catalyst. 4,683,219, Cl. 502-304.000.

Coutin, Pierre F.: *See*—
Duclos, Didier A.; and Coutin, Pierre F., 4,682,529, Cl. 89-1.510.

Cowen, Steven J., to United States of America, Navy. Hermetic high pressure fiber optic bulkhead penetrator. 4,682,846, Cl. 350-96.180.

Craig, William S., to Phillips Petroleum Company. Purification of pichia produced lipophilic proteins. 4,683,293, Cl. 530-359.000.

Crain, Ronald: *See*—
Toldi, George; Nigam, Anil; Crain, Ronald; and Mercurio, Dominic, 4,683,506, Cl. 360-105.000.

Crane Electronics, Inc.: *See*—
Bryce, J. Robert, 4,682,839, Cl. 439-598.000.

Craun, Gary P.: *See*—
Lin, Ju-Chui; Abbey, Kirk J.; Craun, Gary P.; and Robinson, Peter V., 4,683,271, Cl. 525-403.000.

Crawford, James B. Method and apparatus for the running and pulling of wire-line tools and the like in an oil or gas well. 4,682,657, Cl. 166-385.000.

Credle, William S., Jr., to Coca-Cola Company, The. Double-acting diaphragm pump and reversing mechanism therefor. 4,682,937, Cl. 417-393.000.

Crichton, Robert: *See*—
Anton, Octavian; Crichton, Robert; and Lenders, Jean-Pierre, 4,683,203, Cl. 435-94.000.

Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., to International Business Machines Corporation. Video mode plasma panel display. 4,683,470, Cl. 340-771.000.

Crivello, James V.; and Lee, Julia L., to General Electric Company. Photopolymerizable organic compositions and diaryliodonium salts used therein. 4,683,317, Cl. 556-64.000.

Crockett, Dennis D.: *See*—
Weaver, Robert J.; Young, Ronald F.; and Crockett, Dennis D., 4,683,011, Cl. 148-26.000.

Crosslen, Louis J., to Frank Mayer & Associates. Security device for point-of-sale display rack and primarily store shelving. 4,682,825, Cl. 312-42.000.

Crossman, Richard L.: *See*—
Berger, Robert E.; Crossman, Richard L.; and Conley, William F., 4,682,640, Cl. 152-405.000.

Crouch, Earl T.: *See*—
Curry, Herbert L.; and Crouch, Earl T., 4,683,169, Cl. 428-337.000.

Crowell, Robert L.: *See*—
Magruder, Thomas A.; and Crowell, Robert L., 4,682,557, Cl. 114-39.000.

Crowley, George C.: *See*—
Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., 4,683,369, Cl. 219-364.000.

Crozat, Georges: *See*—
Payre, Didier; Crozat, Georges; and Spinner, Bernard, 4,682,476, Cl. 62-480.000.

Cruess, Michael W.: *See*—
Tietjen, Donald L.; and Cruess, Michael W., 4,683,534, Cl. 364-200.000.

Curlee, James D., to Pneumedic Corp. Compound force sacro-lumbar support belt. 4,682,587, Cl. 128-78.000.

Curlee, James D., to Pneumedic Corp. Compound force therapeutic corset. 4,682,588, Cl. 128-78.000.

Curry, Herbert L.; and Crouch, Earl T., to General Electric Company. Methyl methacrylic coatings on thermoplastic film. 4,683,169, Cl. 428-337.000.

Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Polymer polyols derived from novel dispersing media. 4,683,272, Cl. 525-404.000.

Cutright, Robert A.; Briggs, Mark W.; and Bouwman, George J., to Wehr Corporation. Apparatus for use in testing circuit boards. 4,683,424, Cl. 324-158.00F.

Cyclops Corporation: *See*—
Hartman, Thomas W.; and Ryan, Thomas G., 4,682,456, Cl. 52-221.000.

D. Drukker & Zn. N.V.: *See*—
Seal, Michael, 4,683,400, Cl. 315-3.500.

Dai, Shenghong A.; and Sherwood, Philip W., to Dow Chemical Company, The. Azetidinedione compounds as crosslinkers for electrodeposited coatings. 4,683,302, Cl. 540-356.000.

Daicel Chemical Industries, Ltd.: *See*—
Ishii, Kunio; and Shibata, Tohru, 4,683,341, Cl. 568-366.000.
Yanami, Tetsuji; Murai, Yoshiyuji; and Oshima, Ryoichi, 4,683,297, Cl. 536-18.600.

Daikin Industries Ltd.: *See*—
Ohsaka, Yohnosuke; Amimoto, Yoshio; and Negishi, Yoshio, 4,683,289, Cl. 528-402.000.

Dailey, George F.: *See*—
Cooper, Frank W., Jr.; and Dailey, George F., 4,683,109, Cl. 376-261.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Kitamura, Hideaki; Fujiki, Syogo; and Yamada, Mitsuhiko, 4,683,500. Cl. 358-280.000.
Komatsubara, Shoji; Hatabe, Yukio; Horikawa, Tooru; Murasawa, Sadao; and Murakami, Hajime, 4,682,881, Cl. 355-10.000.
Kuwabara, Akira, 4,683,499, Cl. 358-264.000.

Daiwa Seiko Inc.: *See*—
Inoue, Koi; Go, Youki; and Naeki, Yoshihiro, 4,682,439, Cl. 43-24.000.

Dakten Products Corp.: *See*—
Tenenbaum, Martin, 4,682,493, Cl. 73-118.100.

Daldry, Kenneth J.; Fischman, Martin; and Rehkopf, Charles H., to North American Philips Consumer Electronics Corp. High voltage processing of CRT mounts. 4,682,963, Cl. 445-5.000.

Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, to Imperial Chemical Industries, PLC. Pyridine dicarboxylic ester metal extractants. 4,683,310, Cl. 546-321.000.

Daly, Jeffery E.; and Schumacher, Percy W., to Reed Tool Company. Mounting means for cutting elements in drag type rotary drill bit. 4,682,663, Cl. 175-329.000.

Damon Biotech, Inc.: *See*—
Tsang, Wen-Ghih, 4,683,092, Cl. 264-4.300.

Danieli & C. Officine Meccaniche SpA: *See*—
Cicin-Sain, Ivo, 4,682,428, Cl. 37-104.000.

Dard, Jean-Claude: *See*—
Ferrari, Alphonse; Roche, Michel; and Dard, Jean-Claude, 4,683,476, Cl. 346-29.000.

Das, K. Bhagwan, to Boeing Company, The. Weld rod. 4,683,368, Cl. 219-146.100.

Data Switch Corporation: *See*—
Young, Gladstone F.; Green, Richard F.; Miller, S. David; and Quinlan, Thomas J., III, 4,683,564, Cl. 370-63.000.

David, Constant V. Rotary fluidized bed combustion system. 4,683,541, Cl. 364-500.000.

Davis, Gregory B.; and Buchanan, Michael S., to Wm. T. Burnett & Co., Inc. Polyurethane foam-fiber composites. 4,683,246, Cl. 521-54.000.

Dawson, Brian D.; and Leacock, James R., to Emhart Industries, Inc. Proportional power demand audio amplifier control. 4,683,591, Cl. 381-85.000.

Dawson, James E.: *See*—
Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., 4,682,666, Cl. 180-89.130.

Dayco Products, Inc.: *See*—
Hollaway, Gerald C., Jr., 4,683,270, Cl. 525-347.000.

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De Burgat, Michel; Le Traon, Andre ; Pilet, Jean-Claude; and Sharaiha, Ammar, to Universite de Rennes I. Method and apparatus for rapidly testing capacitors and dielectric materials. 4,683,417, Cl. 324-60.00C.

DeCaprio, Vincent H. Localizing biopsy apparatus. 4,682,606, Cl. 128-754.000.

De Cesare, Dominc. Compound induction electric rotating machine. 4,683,388, Cl. 310-46.000.

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Ruhter, Martin L.; and Loney, Allan F., 4,682,787, Cl. 280-775.000.

Deffeves, Kenneth S.; and Rosenblatt, Aaron A., to Scopas Technology Company, Inc., The. Hydrophobic, crystalline, microporous silaceous materials of regular geometry. 4,683,318, Cl. 556-173.000.

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DeGroot, Richard D., to International Business Machines Corporation. Special accumulate instruction for multiple floating point arithmetic units which use a putaway bus to enhance performance. 4,683,547, Cl. 364-748.000.

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Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

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Werle, Peter; Focke, Holger; and Boes, Alwin, 4,683,307, Cl. 544-198.000.

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Koroscil, Anthony; Smithey, Walter A.; and Delgado, Paul A., 4,682,544, Cl. 102-336.000.

Delgado, Paul A.: *See*—
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Hillier, Raymond G., 4,683,174, Cl. 428-583.000.

DeLoach, Anthony, to Water Equipment Services, Inc. Loose fill media cleaning apparatus. 4,682,613, Cl. 134-58.00R.

Deltasider SpA: *See*—
Marino, Emilio; and Mastromarino, Raffaele, 4,682,717, Cl. 222-591.000.

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de Macario, Everly C.; Jovell, Robert J.; and Macario, Alberto J. L., to Health Research, Incorporated. Microsample holder and carrier therefor. 4,682,890, Cl. 356-244.000.

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Demo, Elmer W. Removable self-contained flood protection device and method of installation. 4,682,443, Cl. 49-466.000.

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Dentsply Research & Development Corp.: *See*—
Warrin, George E., 4,682,949, Cl. 433-81.000.

Derichs, Josef, to W. Schlafhorst & Co. Method and device for producing a textile web by pneumatic weft picking or insertion. 4,682,636, Cl. 139-435.000.

de Ridder, Rene M.; and Fluitman, Johannes H. J., to Stichting Centruum Voor Micro Electronika Twente. Thin film magnetometer. 4,683,535, Cl. 324-249.000.

De Rigal, Jean P.; Leveque, Jean-Luc; Rasseneur, Laurent B.; and Losch, Marie-Jeanne, to "L'Oreal". Apparatus for measuring viscoelastic properties of skin in vivo. 4,682,608, Cl. 128-774.000.

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Design Mobility, Inc.: *See*—
Reich, Peter S., 4,682,377, Cl. 5-86.000.

DeSoto, Inc.: *See*—
Ansel, Robert E., 4,682,851, Cl. 350-96.340.
Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., 4,683,280, Cl. 528-71.000.

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Kappeler, Otmar, 4,683,444, Cl. 331-25.000.
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Doman, D. Mark; and Moss, William R., 4,682,729, Cl. 239-2.200.

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Conigliaro, Anthony; St. Hilaire, Arthur; and De Yoreo, Sal G., 4,682,740, Cl. 241-282.100.

Diamond, Gary C. Combinate polyhedra. 4,682,450, Cl. 52-81.000.

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Parrow, R. Alan; and DiAntonio, Francis W., 4,682,796, Cl. 285-39.000.

Diaz, Zaida; and Miller, James H., to Shell Oil Company. Glycerine purification process. 4,683,347, Cl. 568-869.000.

Dickens, James. Sled skis. 4,682,781, Cl. 280-22.000.

Diehl, Manfred. Builder for washing agents. 4,683,073, Cl. 252-135.000.

Diehl, Roy E.: *See*—
Berger, Alvin H.; and Diehl, Roy E., 4,682,672, Cl. 184-106.000.

Diesel Equipment Limited: *See*—
Kipling, Graham V., 4,682,621, Cl. 137-116.300.

Dimmick, Gary S.; and Lockerman, Scott, to Lockman Products Company, Inc. Personal locking device. 4,682,481, Cl. 70-14.000.

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Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, 4,682,855, Cl. 350-276.00R.

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Lerner, Lawrence; and Diskin, Stephen P., 4,682,670, Cl. 181-287.000.

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Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, 4,683,184, Cl. 430-57.000.
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Koleske, Joseph V.; and Domeier, Linda A., 4,683,287, Cl. 528-357.000.

Domenighetti, Domenico, to Simesa-Societa Italiana Montaggi e Servizi Affini S.p.A. Device for controlling the pressure upon the ground of a screed unit of vibrating finishing machine for road paving. 4,682,908, Cl. 404-84.000.

Dominianni, Samuel J.; and Yen, Terence T., to Eli Lilly and Company. Imidazolium hypoglycemic agents. 4,683,312, Cl. 548-341.000.

Donaldson, Robert D.: *See*—
Tuss, John J.; and Donaldson, Robert D., 4,682,418, Cl. 33-1.00M.

Dondi, Giuliano, to Pietro Dondi & Figli S.r.l. Trench-digger implement carried by a laterally extending boom and drive therefor. 4,682,427, Cl. 37-91.000.

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Langpape, Reinhart; Dorrscheidt, Wolfgang; Roze, Jean-Philippe; and Steinleitner, Gunther, 4,683,179, Cl. 429-104.000.

Dover Corporation: *See*—
Wood, Chester W., 4,682,714, Cl. 222-153.000.

Dow Chemical Company, The: *See*—
Britt, Thomas R.; and Burton, Willie C., 4,683,333, Cl. 564-414.000.
Dai, Shenghong A.; and Sherwood, Philip W., 4,683,302, Cl. 540-356.000.
Hefner, Robert E., Jr., 4,683,276, Cl. 526-262.000.
Lampton, Robert D., Jr.; and Hopkins, Thomas M., II, 4,683,076, Cl. 252-191.000.
Wagers, Kevin J., 4,683,015, Cl. 156-66.000.

Dow Corning Corporation: *See*—
Maxson, Myron T., 4,683,277, Cl. 528-21.000.

Dowell, Robert I.: *See*—
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian G., 4,683,232, Cl. 514-228.000.

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Kucera, Clare H., 4,683,068, Cl. 252-8.551.

Doyle, Arthur F.: *See*—
Sklarski, Dennis J.; and Doyle, Arthur F., 4,683,162, Cl. 428-182.000.

Dragan, William B. Device and method of bonding and veneering dental material to a tooth. 4,682,950, Cl. 433-90.000.

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Brunke, Ernst-Joachim; and Struwe, Hartmut, 4,683,083, Cl. 252-522.00R.

Dravo Corporation: *See*—
Oyler, John F.; Brand, Jerry D.; and Zavada, Richard, 4,683,029, Cl. 196-14.520.

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Drexler, Jerome, 4,683,371, Cl. 235-487.000.

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Baggen, Constant P. M. J.; Driessen, Leonardus M. H. E.; Pollen, Rudy W. J.; and Vries, Lodewijk B., 4,683,572, Cl. 371-37.000.

Driggers, John M., to Westinghouse Electric Corp. Brazing apparatus having a dual function heating and eddy current probe coil. 4,683,361, Cl. 219-10.430.

Droller, Richard; and Farrington, Richard I., to Coleco Industries, Inc. Figure toy with rapidly retractable trap element. 4,682,968, Cl. 446-268.000.

Drori, Mordeki. Multiple-disc type filters. 4,683,060. Cl. 210-448.000.

Drouet, Michel G., to Hydro-Quebec. Method and device for controlling the erosion of the electrodes of a plasma torch. 4,683,367, Cl. 219-121.0PY.

Drueck, Fred, Jr. Pentagonal dodecahedron. 4,682,726, Cl. 229-108.000.

Dubois, Craig; and Fontaine, Brian, to Coleco Industries, Inc. Figure toy with extensible head portion. 4,682,970, Cl. 446-309.000.

Duchet, Christian; and Martin, Rene , to Compagnie Generale D'Electricite. High sensitivity interferential electro-optical modulator. 4,683,448, Cl. 332-7.510.

Duchin, Daniel, to Monarch Marking Systems, Inc. Tag dispensing and attaching apparatus. 4,682,721, Cl. 227-67.000.

Duclos, Didier A.; and Coutin, Pierre F., to R. Alkan & Cie. Modular devices for loading cartridges on board aircraft. 4,682,529, Cl. 89-1.510.

Ducret, Lucien C. Bushing for BX cable. 4,683,350, Cl. 174-83.000.

Dudek, Dietmar: *See*—
Sondergeld, Manfred A. J.; Dudek, Dietmar; and Hossner, Klaus, 4,683,190, Cl. 430-281.000.

Duenas, Oswaldo A. Quick change, adjustable tool holder. 4,682,521, Cl. 82-36.00R.

Dufoug, Gilbert E., to Ets. Bonnet. Controlled-access apparatus for the agricultural food industries. 4,683,381, Cl. 307-125.000.

Dugan, Jeffrey S., to Springs Industries, Inc. Mattress pad and fitted bed sheet. 4,682,379, Cl. 5-500.000.

Duke Power Company: *See*—
Terrell, Michael S., 4,682,507, Cl. 73-863.570.

Dungs, Horst: *See*—
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,683,030, Cl. 201-6.000.

Dunlop Limited: *See*—
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Dunn, Robert B.; and Wiltshire, Bruce, to Northern Telecom Limited. Multiple contact zero insertion force connector. 4,682,834, Cl. 439-267.000.

Dunnavant, William R.; Fechter, Robert B.; Gardikes, John J.; and Langer, Heimo J., to Ashland Oil, Inc. Phenolic resin-polyisocyanate binder systems containing an organohalophosphate and use thereof. 4,683,252, Cl. 523-143.000.

Dunsmore, Gerald L.: *See*—
Kerr, Jack R.; Dunsmore, Gerald L.; and Shelton, Thomas V., 4,682,924, Cl. 411-329.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bergna, Horacio E.; Corbin, David R.; and Sonnichsen, George, 4,683,334, Cl. 564-474.000.
Fahmy, Mohamed A. H., 4,683,224, Cl. 514-120.000.
Josey, Alden D., 4,683,091, Cl. 260-543.00R.
Petersen, W. Christian, 4,683,000, Cl. 71-92.000.
Rao, Velliyur N. M., 4,683,329, Cl. 560-338.000.
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Delueg, Werner; and Gandini, Mario, 4,682,883, Cl. 355-38.000.

Durum, Metin M., to Borg-Warner Corporation. Magnetic gear tooth separation detector. 4,683,427, Cl. 324-207.000.

Duruz, J. J., to Eltech Systems Corporation. Dimensionally stable anode for molten salt electrowinning and method of electrolysis. 4,683,037, Cl. 204-64.00R.

Dussault, Paul G.: *See*—
Slavik, William H.; Carlson, William P.; Cepynsky, George L.; Dussault, Paul G.; Margison, Steven E.; and Wolf, James A., Jr., 4,682,958, Cl. 434-335.000.

Dutt, Herbert V.; Foldesi, Istvan; and Santostasi, Paul A., to Sun Coast Plastics, Inc.; and Montreal Milling Cutter and Company, Inc. Process for forming a two part closure. 4,683,016, Cl. 156-69.000.

Eastman Kodak Company: *See*—
Atkinson, William C., 4,682,870, Cl. 354-275.000.
Braun, Hilarion; and Bray, Fletcher, 4,683,477, Cl. 346-75.000.
Jeffers, Frederick J.; and Simonds, John L., 4,683,508, Cl. 360-113.000.
Shipkowski, James P.; and Pearce, Phillip W., 4,683,380, Cl. 250-548.000.

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Beihoff, Bruce C.; Judes, Avie; and Baran, Michael S., 4,683,515, Cl. 361-106.000.
Talwar, Ashok K.; Poole, William E., Jr.; and Steinkolk, Richard B., 4,683,447, Cl. 331-177.00V.
Wojtanek, Guy A., 4,683,359, Cl. 200-314.000.

Ebata, Sakae; and Ohshima, Nobuaki, to Hitachi, Ltd. Turbine pedestal. 4,682,754, Cl. 248-639.000.

ECC International Limited: *See*—
Goodman, Howard, 4,683,259, Cl. 524-447.000.

Echlin, Inc.: *See*—
Shaff, Gerald, 4,682,470, Cl. 60-299.000.

Eddy, William C., Jr., to Allied Corporation. Variable rate shock absorber. 4,682,675, Cl. 188-299.000.

Edson, James B., to ADT, Inc. Alarm system test annunciator. 4,683,459, Cl. 340-514.000.

Efco Manufacturing Company Pty, Limited: *See*—
Luker, Graham J., 4,682,799, Cl. 292-169.150.

Eguchi, Ken; Matsuda, Hiroshi; Haruta, Masahiro; Nishimura, Yukuo; Hirai, Yutaka; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Method of forming deposition film. 4,683,147, Cl. 427-54.100.

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Saito, Kenji; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nishimura, Yukuo; and Nakagiri, Takashi, 4,682,897, Cl. 374-45.000.

Ehrreich, John E., to Ercon, Inc. One-component, particle-filled compositions. 4,683,082, Cl. 252-506.000.

Eida, Tsuyoshi: *See*—
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.

Eidos Corporation: *See*—
Rudolph, Steven M.; and Maxwell, Donald J., 4,682,750, Cl. 248-421.000.

Eisenlohr, Franz, to Sulzer Brothers Limited. Device for screening fluff from entering a shed. 4,682,633, Cl. 139-1.00C.

Electroplating Engineers of Japan, Limited: *See*—
Murata, Yasuto; Tezuka, Junichi; and Yamamoto, Kenji, 4,683,045, Cl. 204-206.000.

Eli Lilly and Company: *See*—
Boeck, LaVerne D., 4,683,204, Cl. 435-128.000.
Dominianni, Samuel J.; and Yen, Terence T., 4,683,312, Cl. 548-341.000.
Hamill, Robert L.; and Yao, Raymond C., 4,683,201, Cl. 435-75.000.
Hynes, Martin D., 4,683,235, Cl. 514-282.000.
Kukolja, Stjepan; and Wright, Walter E., 4,683,227, Cl. 514-202.000.
Laguzza, Bennett C.; Nichols, Cynthia L.; and Bach, Nicholas J., 4,683,313, Cl. 548-437.000.
Mabe, James A.; and Nakatsukasa, Walter M., 4,683,206, Cl. 435-253.000.
Marzoni, Gifford P.; and Garbrecht, William L., 4,683,237, Cl. 514-288.000.
Waarvik, Thomas L., 4,683,207, Cl. 435-311.000.
Whitten, Kathleen R.; Garbrecht, William L.; Marzoni, Gifford P.; and Parli, C. John, 4,683,236, Cl. 514-288.000.

Elmer, Arthur E. H., to Kysor Industrial Corporation. Viscous drive with variable pump action. 4,682,679, Cl. 192-58.00C.

Elsmore, Jeff; Stoorza, Kenneth W.; and Walker, Timothy A., to ITT Corporation. Display terminal having multiple character display formats. 4,683,469, Cl. 340-723.000.

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Duruz, J. J., 4,683,037, Cl. 204-64.00R.

Emery, Richard T.: *See*—
Chang, Shih-Jeh; Emery, Richard T.; and Hakim, Shafik J., 4,683,584, Cl. 379-269.000.

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Dawson, Brian D.; and Leacock, James R., 4,683,591, Cl. 381-85.000.
Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., 4,682,996, Cl. 65-25.100.

Emoto, Masami; Gotoh, Hiroshi; and Inuzuka, Hideo, to Ricoh Company, Ltd. Optical pickup with a two-detector arrangement. 4,683,559, Cl. 369-44.000.

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Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, 4,682,855, Cl. 350-276.00R.

Engelhardt, Bill: *See*—
Clift, Miner; and Engelhardt, Bill, 4,682,619, Cl. 137-68.100.

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Atherton, Jay W.; Castor, Raymond A.; Christie, Leonard F.; and Engerman, Robert C., 4,683,439, Cl. 330-10.000.

Enoshita, Ryosuke: *See—*
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

Epler, Alan H. Diesel fuel additive. 4,682,984, Cl. 44-56.000.

Ercon, Inc.: *See—*
Ehrreich, John E., 4,683,082, Cl. 252-506.000.

Erickson, Paul M., to Motorola Inc. Synchronization method for deriving a reference signal from a pilot frequency. 4,683,445, Cl. 331-25.000.

Erickson, Ward W. Tilling apparatus for preparing a ridge and furrowed field. 4,682,658, Cl. 172-73.000.

Erlandson, Erik E. Variable-stroke constant-compression-ratio reversible radial pump. 4,682,532, Cl. 92-13.700.

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Ernst, Hans-H., to Britax-Kolb GmbH & Co. Deflection device for a safety belt arrangement having progressive belt clamping. 4,682,791, Cl. 280-806.000.

Ernst, M. Eric; and Jewett, Walter L., to Pivot Manufacturing Company. Vehicle top carrier. 4,682,719, Cl. 224-310.000.

Ertley, Holmes E. Waste recycling kit. 4,682,699, Cl. 211-71.000.

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Sklarski, Dennis J.; and Doyle, Arthur F., 4,683,162, Cl. 428-182.000.

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Nelson, Gunner E., 4,683,321, Cl. 556-478.000.

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Ewald Witte & Co.: *See—*
Ruckert, Edvard; and Golz, Gerhard, 4,682,906, Cl. 403-409.100.

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Muller, Walter, 4,682,944, Cl. 425-549.000.

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Belleville, Ernest L.; and Gaudreau, Laurent R., 4,683,098, Cl. 264-302.000.

Exxon Chemical Patents Inc.: *See—*
Ahner, Mary E., 4,683,268, Cl. 525-237.000.

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Lee, Wei-Kuo; and Wong, Hin-Wan, 4,682,986, Cl. 48-210.000.

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Brewster, Phillip W.; Smith, Clinton R.; and Gowland, Frederick W., 4,683,069, Cl. 252-32.70E.
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Farrell, Geoffrey: *See—*
Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; Mason, Margaret, executor; and Shindler, Geoffrey A., executor, 4,683,028, Cl. 162-275.000.

Farrington, Richard I.: *See—*
Droller, Richard; and Farrington, Richard I., 4,682,968, Cl. 446-268.000.

Fauvet, Jean-Pierre; and Parisel, Jacques, to La Telemecanique Electrique. Speed determining process and a device for implementing same. 4,683,545, Cl. 364-565.000.

Fechter, Robert B.: *See—*
Dunnavant, William R.; Fechter, Robert B.; Gardikes, John J.; and Langer, Heimo J., 4,683,252, Cl. 523-143.000.

Feight, Robert A.; Jaqua, Vance W.; and Trom, Joseph, Jr. Explosively driven latch/seal device. 4,682,779, Cl. 277-34.300.

Feldt, Mats, to Landstingens Inkopscentral Lic, Ekonomisk Forening. Delivery bed. 4,682,376, Cl. 5-60.000.

Feller AG: *See—*
Max, Jean-Joseph; and Shah, Arvind, 4,683,450, Cl. 333-202.000.

Feller, Gilbert M.: *See—*
Stalter, Joseph F., deceased; and Feller, Gilbert M., 4,683,021, Cl. 156-415.000.

Ferag AG: *See—*
Honegger, Werner, 4,682,741, Cl. 242-55.000.

Ferbas, Dennis K.: *See—*
Cairns, James L.; and Ferbas, Dennis K., 4,682,848, Cl. 350-96.210.

Ferchau, Joerg U.; and Trujillo, Victor D., to Tandem Computers Incorporated. Alignment and connection mechanism. 4,682,833, Cl. 439-377.000.

Feres, Vaclav. Thin layer evaporator. 4,683,026, Cl. 159-6.100.

Ferrari, Alphonse; Roche, Michel; and Dard, Jean-Claude, to Benson S.A. Drawing machine having automatically replaced writing members and apparatus therefor. 4,683,476, Cl. 346-29.000.

Ferrari, Giorgio; and Vecchietti, Vittorio, to SIMES S.p.A. Societa Italiana Medicinali e Sintetici. Laevorotatory antipode of moprolol as an antihypertensive. 4,683,245, Cl. 514-652.000.

Ferrari, Harry M.; and Wilson, John F., to Westinghouse Electric Corp. Nuclear reactor. 4,683,116, Cl. 376-447.000.

Ferraro, Frank A., to Warner-Lambert Company. Method of securing a shaving aid to a razor cartridge. 4,683,096, Cl. 264-249.000.

Ferro Corporation: *See—*
Kammann, Karl P., Jr.; and Troxel, Kathleen A., 4,683,081, Cl. 252-392.000.

Feuerbaum, Hans-Peter, to ICT Integrated Circuit Testing Gesellschaft, fuer Halbleiterpruftechnik mbH. Opposing field spectrometer for electron beam mensuration technology. 4,683,376, Cl. 250-309.000.

Fiberlock Technologies, Inc.: *See—*
Healey, Brian J., 4,682,448, Cl. 52-63.000.

Fifth Dimension Inc.: *See—*
Bitko, Sheldon S., 4,683,355, Cl. 200-61.470.

Figiel, Janusz; Tremper, Donald; and Lems, Peter, to Signode Corporation. Method and apparatus for forming a loop with end-gripped strap. 4,683,017, Cl. 156-73.100.

Figos, Societe Anonyme: *See—*
Mestdagh, Jacques, 4,682,826, Cl. 312-42.000.

Finfrock, Don C.: *See—*
Kelch, Russell K.; Finfrock, Don C.; Girard, Donald J.; Seevers, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., 4,683,531, Cl. 364-200.000.

Fink, Henry: *See—*
Palmer, William B.; and Fink, Henry, 4,682,804, Cl. 294-82.260.

Finn, Richard F.: *See—*
Munsell, Monroe W.; and Finn, Richard F., 4,683,070, Cl. 252-33.400.

Finney, Roy P., to Medical Engineering Corporation. Penile prosthesis. 4,682,589, Cl. 128-79.000.

Finnigan Corporation: *See—*
Steiner, Urs; Hurst, James; and Schier, J. Alan, 4,682,508, Cl. 73-866.500.

Fischman, Martin: *See—*
Daldry, Kenneth J.; Fischman, Martin; and Rehkopf, Charles H., 4,682,963, Cl. 445-5.000.

Fity, Christian: *See—*
Andre, Jean-Luc; and Fity, Christian, 4,682,922, Cl. 410-30.000.

Flanigen, Edith M.: *See—*
Lok, Brent M.; Vail, Lawrence D.; and Flanigen, Edith M., 4,683,217, Cl. 502-214.000.

Flores, A. Roland, to Graver Company, The. Method and apparatus to convert a long tube vertical evaporator to a falling film evaporator. 4,683,025, Cl. 159-2.100.

Flour City Architectural Metals, Division of E.G. Smith Construction Products, Inc.: *See—*
Schmidt, Gerhard, 4,682,578, Cl. 126-91.00R.

Floyd, David T.; Shanklin, Garry L.; Lynch, Gordon E.; and Meitner, Gary H., to Kimberly-Clark Corporation. One step dry-and-shine polishing cloth. 4,683,001, Cl. 106-3.000.

Fluitman, Johannes H. J.: *See—*
de Ridder, Rene M.; and Fluitman, Johannes H. J., 4,683,535, Cl. 324-249.000.

Focke, Holger: *See—*
Werle, Peter; Focke, Holger; and Boes, Alwin, 4,683,307, Cl. 544-198.000.

Fogaroli, Giuseppe: *See—*
Carena, Ugo; Coli, Giuseppe; and Fogaroli, Giuseppe, 4,683,501, Cl. 358-293.000.

Fohr, Robert D.; and Tieze, Jeffrey E. Underseat tackle container. 4,682,813, Cl. 297-192.000.

Foldesi, Istvan, to Montreal Milling Cutter Company. Apparatus for forming and attaching a flexible foil sealing disk. 4,682,463, Cl. 53-298.000.

Foldesi, Istvan: *See—*
Dutt, Herbert V.; Foldesi, Istvan; and Santostasi, Paul A., 4,683,016, Cl. 156-69.000.

Fong, Dodd W.: *See—*
Rose, Gerard R.; Kaesler, Ralph W.; and Fong, Dodd W., 4,683,066, Cl. 210-734.000.

Fontaine, Brian: *See—*
Dubois, Craig; and Fontaine, Brian, 4,682,970, Cl. 446-309.000.

Ford Meter Box Company, Inc., The: *See—*
Turner, Clarence C., 4,682,624, Cl. 137-318.000.

Ford Motor Company: *See—*
Berger, Alvin H.; and Diehl, Roy E., 4,682,672, Cl. 184-106.000.
Hurten, Oskar; Vogt, Hans; and Stutenkemper, Paul, 4,682,812, Cl. 296-195.000.
Simko, Aladar O., 4,682,575, Cl. 123-90.440.

Forsman, Allyn J., to Honeywell Inc. Training device. 4,682,952, Cl. 434-12.000.

Forsythe Cosmetic Group, Ltd.: *See—*
Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., 4,683,007, Cl. 106-308.00M.

Fortmann, Manfred: *See—*
Neuelmann, Rolf; and Fortmann, Manfred, 4,683,419, Cl. 324-64.000.

Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., to Emhart Industries, Inc. Parison formation in the manufacture of hollow articles of glassware. 4,682,996, Cl. 65-25.100.

Foster Wheeler Energy Corporation: *See*—
Garcia-Mallol, Juan A.; and Alliston, Michael G., 4,682,567, Cl. 122-4.00D.

Foulke, Richard F.; and Lord, Steven M., to Proconics International, Inc. Wafer transfer apparatus. 4,682,928, Cl. 414-416.000.

Framatome: *See*—
Sevelinge, Gerard, 4,682,739, Cl. 241-275.000.

Framatome & Cie.: *See*—
Jahnke, Serge, 4,683,106, Cl. 376-259.000.
Martin, Alain; and Maillard, Philippe, 4,682,725, Cl. 228-119.000.
Martin, Jean; and Peletan, Rene , 4,683,102, Cl. 376-209.000.

Francis, John H.; and Van DerLinden, Roy E., to Frederick Manufacturing Company, Inc. Variable speed drive—apparatus and method of fabricating the apparatus. 4,682,517, Cl. 74-796.000.

Frank Mayer & Associates: *See*—
Crosslen, Louis J., 4,682,825, Cl. 312-42.000.

Frankel, Milton B.; and Wilson, Edgar R., to Rockwell International Corporation. Polyazido esters. 4,683,085, Cl. 260-349.000.

Frankel, Milton B.; and Wilson, Edgar R., to Rockwell International Corporation. Azido derivatives of pentaerythritol. 4,683,086, Cl. 260-349.000.

Franz, Michael R. Apparatus and method for recording monophasic action potentials from an in vivo heart. 4,682,603, Cl. 128-642.000.

Freber, Elmer C., to Marquette Tool & Die Company. Adjustable head restraint for vehicular seats. 4,682,817, Cl. 297-408.000.

Frederick Manufacturing Company, Inc.: *See*—
Francis, John H.; and Van DerLinden, Roy E., 4,682,517, Cl. 74-796.000.

Freelain, Kenneth W. Water pipe. 4,682,610, Cl. 131-173.000.

Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., to Merck Frosst Canada, Inc. Leukotriene antagonists. 4,683,325, Cl. 560-10.000.

Fresenius AG: *See*—
Polaschegg, Hans-Dietrich, 4,683,053, Cl. 210-86.000.

Freudenmann, Kurt; and Wiese, Heiner, to ITW Ateco. One-piece clip-shaped holder for elongated articles. 4,682,748, Cl. 248-73.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Bretthauer, Karlheinz; and Obenauf, Hans-Dietrich, 4,683,577, Cl. 373-105.000.

Fried, Morton. Temperature offset control system. 4,682,648, Cl. 165-12.000.

Friedrichsfeld GmbH Keramik-und Kunststoffwerke: *See*—
Hildner, Knut, 4,682,797, Cl. 285-40.000.

Fromel, Gustav; and Steinke, Alexander, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor fuel assembly. 4,683,115, Cl. 376-439.000.

FSI Corporation: *See*—
Burkman, Don C.; Schumacher, David D.; and Peterson, Charlie A., 4,682,615, Cl. 134-102.000.
Silvernail, James M.; and Schneider, Dallas J., 4,682,614, Cl. 134-99.000.

Fuchs, Alfred E., to Potters Industries, Inc. Microbicidal coated beads. 4,682,992, Cl. 55-279.000.

Fuchs, Hugo; Brand, Uwe; and Buchaeckert, Helmut, to BASF Aktiengesellschaft. Obtaining caprolactam by cleaving oligomers of caprolactam. 4,683,305, Cl. 540-533.000.

Fuji Photo Film Co., Ltd.: *See*—
Hishinuma, Kazuhiro; and Ohga, Akihiro, 4,683,377, Cl. 250-327.200.
Idota, Yoshio; and Yagihara, Morio, 4,683,189, Cl. 430-248.000.
Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, 4,683,193, Cl. 430-570.000.
Nishiyama, Shingo, 4,683,192, Cl. 430-567.000.
Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, 4,683,048, Cl. 204-416.000.

Fujibayashi, Kazuo: *See*—
Toyama, Masamichi; Kaneda, Naoya; and Fujibayashi, Kazuo, 4,682,886, Cl. 356-1.000.

Fujicar Manu. Co. Ltd.: *See*—
Kutsumura, Shoji; and Isonaga, Touichi, 4,683,031, Cl. 202-227.000.

Fujii, Haruo; Inaba, Yutaka; and Ando, Yujiro, to Canon Kabushiki Kaisha. Multicolor image recording method and device utilizing a single image transfer to the recording material. 4,682,880, Cl. 355-4.000.

Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, to Kawasaki Jukogyo Kabushiki Kaisha. Valve gear for use in a four cycle engine. 4,682,573, Cl. 123-90.200.

Fujiki, Syogo: *See*—
Kitamura, Hideaki; Fujiki, Syogo; and Yamada, Mitsuhiko, 4,683,500, Cl. 358-280.000.

Fujisoku Electric Co., Ltd.: *See*—
Yano, Takashi; and Yoneyama, Yasuo, 4,683,352, Cl. 200-6.00R.

Fujita, Kunihiro; and Tanaka, Hideaki, to Mitsuboshi Belting Ltd. V-belt for high load power transmission. 4,682,973, Cl. 474-263.000.

Fujitsu Limited: *See*—
Sasaki, Susumu, 4,683,566, Cl. 370-100.000.

Fujiwara, Katsuyoshi; Miwa, Yoshihisa; and Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Electrophotographic copying apparatus with a selecting means of magnification changing elements. 4,682,877, Cl. 355-3.00R.

Fukami, Takeshi: *See*—
Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, 4,683,586, Cl. 380-48.000.

Fukumoto, Shigeaki, to Sharp Kabushiki Kaisha. Exhaust system for a cooking apparatus. 4,682,580, Cl. 126-299.00D.

Fukunaga, Takahiro: *See*—
Taniguchi, Akihiko; Fukunaga, Takahiro; and Shimizu, Eiichi, 4,682,884, Cl. 355-51.000.

Fukutome Meat Packers, Ltd.: *See*—
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.

Fuller Company: *See*—
Cohen, Sidney M., 4,682,948, Cl. 432-58.000.

Fuller, David C.: *See*—
Hengstenberger, Gary M.; Montavon, John I.; and Fuller, David C., 4,682,671, Cl. 182-3.000.

Furukawa, Akihiro; and Ohki, Junichi, to NEC Corporation. Interframe predictive coding apparatus for video signal. 4,683,494, Cl. 358-136.000.

Furuya, Akira: *See*—
Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,683,205, Cl. 435-172.300.

Fusion Systems Corporation: *See*—
Camm, David M., 4,683,525, Cl. 362-346.000.

Fussenegger, Werner: *See*—
Orban, Ivan; and Fussenegger, Werner, 4,683,326, Cl. 560-75.000.

Fymat, Alain L.; Lee, Wai-Nang P.; and Greenfield, Moses A., to University of California, The Regents of the. Coincidence counting emission tomographic probe: method and apparatus. 4,682,604, Cl. 128-659.000.

G. D. Searle & Co.: *See*—
Collins, Paul W.; and Gasiecki, Alan F., 4,683,328, Cl. 560-118.000.
Miyano, Masateru; and Deason, James R., 4,683,241, Cl. 514-512.000.

Gabuzda, Paul G., to Burroughs Corporation (now Unisys Corporation). Segmented heat sink device. 4,682,651, Cl. 165-80.300.

Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating closure. 4,682,702, Cl. 215-232.000.

Gaertner, Adolf W.: *See*—
Wiedenhoff, Wolfgang; Gaertner, Adolf W.; Vogt, Gert; and Weisgerber, Claus, 4,682,632, Cl. 138-178.000.

Gaget, Pierre, to Charbonnages de France. Centrifugal drier drum for wet granular material. 4,682,423, Cl. 34-58.000.

Gaida, Wolfram: *See*—
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,683,238, Cl. 514-292.000.

Gallati, Harald, to Hoffmann-La Roche Inc. Detection method for occult blood. 4,683,197, Cl. 435-7.000.

Galloway, Deane E.: *See*—
Tse, Samuel W.; and Galloway, Deane E., 4,683,170, Cl. 428-349.000.

Gallusser, David O.: *See*—
Punako, Stephen; Gallusser, David O.; and Williams, Warren R., Jr., 4,682,832, Cl. 439-589.000.

Gamma Biologicals, Inc.: *See*—
Meserol, Peter M.; and Acker, Jesse L., 4,683,120, Cl. 422-72.000.

Gandini, Mario: *See*—
Delueg, Werner; and Gandini, Mario, 4,682,883, Cl. 355-38.000.

Ganguli, Keshab L.: *See*—
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,683,088, Cl. 260-409.000.

Garbrecht, William L.: *See*—
Marzoni, Gifford P.; and Garbrecht, William L., 4,683,237, Cl. 514-288.000.
Whitten, Kathleen R.; Garbrecht, William L.; Marzoni, Gifford P.; and Parli, C. John, 4,683,236, Cl. 514-288.000.

Garcia-Mallol, Juan A.; and Alliston, Michael G., to Foster Wheeler Energy Corporation. Fluidized bed steam generator and method of generating steam including a separate recycle bed. 4,682,567, Cl. 122-4.00D.

Gardikes, John J.: *See*—
Dunnavant, William R.; Fechter, Robert B.; Gardikes, John J.; and Langer, Heimo J., 4,683,252, Cl. 523-143.000.

Garrett Corporation, The: *See*—
Gu, Alston L., 4,682,900, Cl. 384-105.000.
Maynard, Frederick C., 4,682,469, Cl. 60-39.060.

Gasiecki, Alan F.: *See*—
Collins, Paul W.; and Gasiecki, Alan F., 4,683,328, Cl. 560-118.000.

Gasner, Earl L.: *See*—
Witczak, Stanley; and Gasner, Earl L., 4,682,543, Cl. 101-350.000.

Gastrock, William H.; and Wepplo, Peter J., to American Cyanamid Company. Process for the resolution of certain racemic amino nitriles. 4,683,324, Cl. 558-354.000.

Gaudin, Carl J. Self sealing sewer cover assembly. 4,682,907, Cl. 404-25.000.

Gaudreau, Laurent R.: *See*—
Belleville, Ernest L.; and Gaudreau, Laurent R., 4,683,098, Cl. 264-302.000.

Gauthier, Gilbert, to Moulinages Henri Lacroix. Device for making a new type of yarn. 4,682,478, Cl. 66-81.000.

Gauthier, Michel: *See*—
Armand, Michel; Chabagno, Jean-Michel; Ricoux, Philippe; Vassort, Guy; Gauthier, Michel; Brochu, Fernand; and Rigaud, Philippe, 4,683,181, Cl. 429-192.000.

Gebr. Happich GmbH: *See*—
Viertel, Lothar; and Kaiser, Klaus-Peter, 4,683,522, Cl. 362-135.000.

Geiser, Joseph. Protective ear covering. 4,682,374, Cl. 2-209.000.

Geisler, Thomas C., to Minnesota Mining and Manufacturing Company. Imageable toner powder. 4,683,191, Cl. 430-291.000.

General Dynamics Land Systems, Inc.: *See*—
Wohler, Johann F., 4,682,528, Cl. 89-1.300.

General Electric Company: *See*—
Allen, Richard B.; and Avakian, Roger W., 4,683,247, Cl. 521-91.000.
Bedard, James F.; and Jaswa, Vilay C., 4,683,570, Cl. 371-36.000.
Crivello, James V.; and Lee, Julia L., 4,683,317, Cl. 556-64.000.
Curry, Herbert L.; and Crouch, Earl T., 4,683,169, Cl. 428-337.000.
Hamilton, James W., Jr.; and Long, Edward A., 4,683,411, Cl. 318-706.000.
Knorowski, Victor J.; Hean, Charles R.; and Placek, Ronald J., 4,682,934, Cl. 416-198.00A.
LeGrand, Donald G.; and Olszewski, William V., 4,683,172, Cl. 428-412.000.
Martin, Jack R., 4,682,935, Cl. 416-223.00A.
Rairden, John R., III, 4,683,148, Cl. 427-34.000.
Reed, Bradley O., 4,682,515, Cl. 74-687.000.
Steele, Douglas S.; Little, Francis H.; Sostarich, Joseph J.; and Ingram, Douglas E., 4,682,964, Cl. 445-28.000.
Stokes, Vijay K., 4,683,393, Cl. 310-156.000.
Thomas, Bradley S.; and Kargetta, David J., 4,682,806, Cl. 294-88.000.
Yazvac, Thomas A., 4,683,517, Cl. 361-358.000.

General Motors Corporation: *See*—
Bish, James R.; McCartney, Charles P., Jr.; and Meadows, Clarence A., 4,683,180, Cl. 429-130.000.

General Signal Corporation: *See*—
Weiss, Edward L., 4,683,374, Cl. 250-227.000.

Georg Knoblauch, Firma: *See*—
Budert, Gunter H., 4,682,688, Cl. 206-1.500.

Geo. A. Hormel & Co.: *See*—
Leining, Lyndon R., 4,682,387, Cl. 17-49.000.

Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Spiro[isoxazalidine-3,2'-tricyclo[3.3.1.1^{3,7}] decanes]. 4,683,311, Cl. 548-240.000.

Gerhard, Helmut, to Westerwaelder Eisenwerk Gerhard GmbH. Device for locking a container. 4,682,923, Cl. 410-90.000.

Gerin, Umberto: *See*—
Meroni, Roberto; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,682,466, Cl. 57-274.000.

Geringer, Miles S.: *See*—
Kaufman, Vernon R.; and Geringer, Miles S., 4,682,571, Cl. 123-73.00A.

Gete, Henri, to Asulab S.A. Method of and a device for identifying the position of the rotor of a stepping motor. 4,683,428, Cl. 324-208.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Kussel, Willy; and Bohle, Werner, 4,682,678, Cl. 192-56.00F.

Giesbrecht, George G.: *See*—
Tolonen, Eric; Tubbe, Clifford J.; Giesbrecht, George G.; and Wiens, John A., 4,683,095, Cl. 264-171.000.

Gilles, Daniel: *See*—
Van Wijnendaele, Frans; Gilles, Daniel; and Simonet, Guy, 4,683,294, Cl. 530-371.000.

Gillespie, James H.: *See*—
Coggins, Leroy; Murphy, Brian R.; Holmes, Dorothy F.; Anguish, Lynne J.; and Gillespie, James H., 4,683,137, Cl. 424-89.000.

Girard, Donald J.: *See*—
Kelch, Russell K.; Finfrock, Don C.; Girard, Donald J.; Seevers, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., 4,683,531, Cl. 364-200.000.

Girouard, Jimmy J. Colon washing methods and apparatus. 4,682,979, Cl. 604-48.000.

Giuliani, Giampiero: *See*—
Armandillo, Errico; Salvetti, Gianemilio; and Giuliani, Giampiero, 4,682,893, Cl. 356-356.000.

Giuliano, James T., to Zotos International, Inc. Novel process and article for preparing artificial nails. 4,682,612, Cl. 132-73.000.

Gjertsen, Robert K.: *See*—
Carlson, William R.; Gjertsen, Robert K.; and Miller, John V., 4,683,117, Cl. 376-449.000.

Glaser, Ronald M.: *See*—
Witiak, Donald T.; and Glaser, Ronald M., 4,683,087, Cl. 260-396.00R.

Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A., to Warner-Lambert Company. Low moisture, sugarless, center-filled chewing gum. 4,683,138, Cl. 426-5.000.

Glassman, Alexander H., to Research Foundation for Mental Hygiene, Inc. Method of preventing withdrawal symptoms associated with the cessation or reduction of tobacco smoking. 4,683,231, Cl. 514-220.000.

Glidden Company, The: *See*—
Abbey, Kirk J., 4,683,173, Cl. 428-425.800.
Bode, Daniel, 4,683,273, Cl. 523-412.000.
Lin, Ju-Chui; Abbey, Kirk J.; Craun, Gary P.; and Robinson, Peter V., 4,683,271, Cl. 525-403.000.
Wickert, Frank A., 4,683,260, Cl. 524-512.000.

Glowacki, Robert D.: *See*—
Turner, Herman E., Jr.; and Glowacki, Robert D., 4,682,710, Cl. 222-63.000.

Go, Youki: *See*—
Inoue, Koi; Go, Youki; and Naeki, Yoshihiro, 4,682,439, Cl. 43-24.000.

Goddard, Errol D., to Union Carbide Corporation. Foamable compositions and processes for use thereof. 4,683,004, Cl. 106-170.000.

Goebel, Konrad; and Schiffers, Ulrich, to Kraftwerk Union Aktiengesellschaft. Clean-gas continuous-flow intermediate storage or accumulator plant. 4,682,620, Cl. 137-110.000.

Goel, Anil B., to Ashland Oil, Inc. Removal of small amounts of water from moisture containing carboxylic acids, alcohols, or phenols by contacting with a tetrasubstituted bicyclic amide acetal. 4,683,077, Cl. 252-194.000.

Goel, Anil B., to Ashland Oil, Inc. Organophosphite accelerators for epoxide curing. 4,683,281, Cl. 528-89.000.

Goel, Anil B., to Ashland Oil, Inc. Novel boron trifluoride-poly (alkylene oxide) amine catalysts for curing epoxy resins. 4,683,282, Cl. 528-91.000.

Goel, Anil B., to Ashland Oil, Inc. Latent accelerators for epoxide curing. 4,683,283, Cl. 528-93.000.

Goel, Anil B., to Ashland Oil, Inc. Oxime carbamate accelerators for curing polyepoxides. 4,683,284, Cl. 528-93.000.

Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Francoise M. M.; Themont, Jean-Pierre; and Vachet, Andre J., to Corning Glass Works. Transparent laminated polarizing glasses. 4,683,133, Cl. 428-1.000.

Gold Star Co., Ltd.: *See*—
Kim, Soo K., 4,633,512, Cl. 360-137.000.

Goldberg, Mel. Face mask with voice modifying capability. 4,683,588, Cl. 381-61.000.

Goldstein, Amnon; and Cooper, John F. Dry process electrostatic developer comprising a generally round magnetic carrier and a flake-type carrier. 4,683,187, Cl. 430-106.600.

Golz, Gerhard: *See*—
Ruckert, Edvard; and Golz, Gerhard, 4,682,906, Cl. 403-409.100.

Goodall, Brian L.: *See*—
Bilhou, Jean L.; and Goodall, Brian L., 4,683,215, Cl. 502-107.000.

Goodman, Howard, to ECC International Limited. Resin compositions comprising organoclays of improved dispersibility. 4,683,259, Cl. 524-447.000.

Goodson, David R. Low voltage continuity tester. 4,683,422, Cl. 324-133.000.

Goodyear Tire & Rubber Company, The: *See*—
Berger, Robert E.; Crossman, Richard L.; and Conley, William F., 4,682,640, Cl. 152-405.000.
Chawla, Surendra K., 4,682,892, Cl. 356-353.000.
Portalupi, Steven J.; and Riggs, Robert S., 4,683,020, Cl. 156-403.000.
Stalter, Joseph F., deceased; and Feller, Gilbert M., 4,683,021, Cl. 156-415.000.
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Goss, Gary J.: *See*—
Holtey, Thomas O.; Bruce, Kenneth E.; and Goss, Gary J., 4,683,466, Cl. 340-703.000.

Gotchel, Joel P.; Norton, Henry J.; Neuenschwander, Rudolf; and Stango, Daniel J., to Scott Paper Company. Dry formed-web embossing apparatus. 4,682,942, Cl. 425-103.000.

Goto, Sumio; Ishibashi, Jiro; and Nemoto, Masakazu, to Tokyo Juki Industrial Co., Ltd. Method and apparatus for performing sewing operations utilizing sewing machine having means to adjust terminal stitch pitch and sew consecutive patterns. 4,682,554, Cl. 112-262.100.

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Gotoh, Hiroshi: *See*—
Emoto, Masami; Gotoh, Hiroshi; and Inuzuka, Hideo, 4,683,559, Cl. 369-44.000.

Goudriaan, Johan C.; and Van der Burgt, Maarten J., to Shell Oil Company. Reactor for non-isothermic reactions for the preparation of hydrocarbons. 4,683,121, Cl. 422-197.000.

Gould, Herbert L. Apparatus for the self-examination of the human eye. 4,682,867, Cl. 351-223.000.

Gounder, Raj N., to RCA Corporation. Spacecraft structure. 4,682,744, Cl. 244-158.00R.

Goutzoulis, Anastasios P., to Westinghouse Electric Corp. Acousto-optic system for testing high speed circuits. 4,683,420, Cl. 324-73.00R.

Gowland, Frederick W.: *See*—
Brewster, Phillip W.; Smith, Clinton R.; and Gowland, Frederick W., 4,683,069, Cl. 252-32.70E.

Graco Inc.: *See*—
Mommsen, Gordon V., 4,682,735, Cl. 239-690.000.

Gradl, Reinhard: *See*—
Kolkmann, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, 4,683,127, Cl. 423-321.00R.

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Zsida, Attila, 4,682,582, Cl. 126-440.000.

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Milligan, Barton; Starner, William E.; Grandin, Roland E.; and Casey, Jeremiah P., 4,683,279, Cl. 528-67.000.

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Kagstrom, Per-Olof; and Abrahamsson, Lars, 4,682,990, Cl. 55-80.000.

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Graver Company, The: *See*—
Flores, A. Roland, 4,683,025, Cl. 159-2.100.

Gray, Warren E., to Northrop Corporation. Mechanically lockable fastener assembly. 4,682,520, Cl. 81-471.000.

Greame, James E.: *See*—
Vollmer, David J.; and Greame, James E., 4,683,453, Cl. 335-255.000.

Vollmer, David J.; and Greame, James E., 4,683,454, Cl. 335-299.000.

Green, Kenneth E.; Johnson, Donald K.; and Woodruff, Roger W., to Norton Company. Refractory shield for superheater tubes. 4,682,568, Cl. 122-235.00C.

Green, Marion C. Means and method for detecting leaks in tanks. 4,682,492, Cl. 73-49.200.

Green, Michael J.; and McKay, James B., to British Columbia Telephone Company. Asynchronous signaling system for digital communication channel. 4,683,567, Cl. 370-110.100.

Green, Richard F.: *See—*
Young, Gladstone F.; Green, Richard F.; Miller, S. David; and Quinlan, Thomas J., III, 4,683,564, Cl. 370-63.000.

Greenfield, Moses A.: *See—*
Fymat, Alain L.; Lee, Wai-Nang P.; and Greenfield, Moses A., 4,682,604, Cl. 128-659.000.

Greenhill, Katherine L.: *See—*
Lin, Chew-Chen; Brown, Winthrop K.; Lankford, Frank L., Jr.; Greenhill, Katherine L.; and Campsey, Ronald L., 4,683,464, Cl. 340-685.000.

Greer, J. Rex. Auxiliary air conditioning, heating and engine warming system for trucks. 4,682,649, Cl. 165-43.000.

Gregory, Richard B.: *See—*
Wilson, Syd R.; Gregory, Richard B.; and Varker, Charles J., 4,682,407, Cl. 29-576.00B.

Grethe, Klaus; and Steven, Hubert, to L. & C. Steinmuller GmbH. Method and apparatus for scrubbing flue gas with flowable absorbing material pursuant to the air flow atomization principle. 4,682,991, Cl. 55-84.000.

Grice, Neal J.: *See—*
Knifton, John F.; and Grice, Neal J., 4,683,335, Cl. 564-480.000.

Grimova, Jaroslava: *See—*
Kuchar, Miroslav; Brunova, Bohumila; Grimova, Jaroslava; and Maturova, Eva, 4,683,331, Cl. 562-459.000.

Grummett, Dennis W., to NCR Corporation. Mask for wave soldering machine. 4,682,723, Cl. 228-39.000.

Grunert, Kurt A.; and Maier, Alfred E., to Westinghouse Electric Corp. Circuit breaker with trip delay magnetic circuit. 4,683,451, Cl. 335-174.000.

Gryglas, Stephen: *See—*
Constantin, Emile J.; and Gryglas, Stephen, 4,682,868, Cl. 353-58.000.

GTE Communication Systems Corporation: *See—*
Thomson, Robert G., 4,683,351, Cl. 379-398.000.

GTE Government Systems Corporation: *See—*
Keller, Ron F., 4,682,413, Cl. 29-825.000.

GTE Products Corporation: *See—*
Johnson, Pierce, Jr., 4,683,397, Cl. 313-344.000.

Gu, Alston L., to Garrett Corporation, The. Thrust bearing underspring. 4,682,900, Cl. 384-105.000.

Gugala, Zbigniew H.: *See—*
Krause, Richard J.; Gugala, Zbigniew H.; and Shah, Madhukant A., 4,683,057, Cl. 210-232.000.

Guichard, Jean, to Messier Hispano Bugatti S.A. Method and system of controlling braking on a wheeled vehicle. 4,683,538, Cl. 364-426.000.

Guillemet, Bernard: *See—*
Jarry, Philippe; Haji, Mohamed L.; Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,683,163, Cl. 428-209.000.

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Gunther, Andreas; Malone, James R.; Lenthe, Manfred; and Hohl, Hans-Walter, to Bayer Aktiengesellschaft. Process for the preparation of 2-arylamino-4,6-dichloro-s-triazines. 4,683,308, Cl. 544-211.000.

Gupte, Arun R.: *See—*
Zierenberg, Bernd; and Gupte, Arun R., 4,683,131, Cl. 424-467.000.

Gwozdz, Adam A., to R. E. Phelon Company, Inc. Ignition for oil burner. 4,683,518, Cl. 361-263.000.

Gyoda, Toshio: *See—*
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.

Haas, Werner; Knuepfer, Wolfgang; and Pfeiler, Manfred, to Siemens Aktiengesellschaft. Non-invasive method and apparatus for in situ disintegration of body calculi. 4,682,600, Cl. 128-328.000.

Hachisu, Kiyoji, to Ichikoh Engineering, Ltd. Apparatus for upward and downward movement of an arm in a robot system for taking out injection molded and die casting products. 4,682,930, Cl. 414-589.000.

Hadwen, Brian M.: *See—*
Strolle, Christopher H.; Smith, Terrence R.; and Hadwen, Brian M., 4,683,490, Cl. 358-30.000.

Hafner, Hans W., to Pfister GmbH. Method and apparatus for continuous gravimetric metering and pneumatic feeding of pourable material. 4,682,915, Cl. 406-31.000.

Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., to Acorn Engineering Company. Vandal resistant and tamper proof pneumatic push button assembly for moving a volume of fluid. 4,682,533, Cl. 92-98.00R.

Hager, Robert E., to Westinghouse Electric Corp. Testable, fault-tolerant power interface circuit for normally de-energized loads. 4,683,105, Cl. 376-259.000.

Hagey, William H.: *See—*
Olsson, Mark S.; Hagey, William H.; and Rosenthal, Brock J., 4,683,523, Cl. 362-267.000.

Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, to Toray Industries, Inc. Method for holding a moving film. 4,683,093, Cl. 264-22.000.

Hahn, Gary S., to Immunetech, Inc. Immunotherapeutic polypeptide agents which bind to lymphocyte immunoglobulin FC receptors. 4,683,292, Cl. 530-328.000.

Hahn, Helmut. Welding apparatus. 4,682,724, Cl. 228-50.000.

Hahn, Ron T.: *See—*
Hafner, V. Walter; Hahn, Ron T.; and Marshall, Keith D., 4,682,533, Cl. 92-98.00R.

Hajek, Manfred: *See—*
Salzburg, Herbert; Hajek, Manfred; Hanssler, Gerd; and Kuck, Varl-Heinz, 4,683,233, Cl. 514-253.000.

Haji, Mohamed L.: *See—*
Jarry, Philippe; Haji, Mohamed L.; Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,683,163, Cl. 428-209.000.

Hakim, Shafik J.: *See—*
Chang, Shih-Jeh; Emery, Richard T.; and Hakim, Shafik J., 4,683,584, Cl. 379-269.000.

Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schwarzenberg, Norbert; Radermacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, to Saint Gobain Vitrage. Process and apparatus for bending glass plates in a horizontal position. 4,682,997, Cl. 65-106.000.

Halilovic, Esref. Device for generating vibrations. 4,682,896, Cl. 366-120.000.

Hall, Charles B.; and Mondek, Martin J., to Outboard Marine Corporation. Relief valve for hydraulic systems. 4,682,759, Cl. 251-210.000.

Hall, Donald R.: *See—*
Concordia, Joseph J.; and Hall, Donald R., 4,683,122, Cl. 422-227.000.

Hall, George R.: *See—*
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,682,526, Cl. 84-1.030.

Hall, Lars, to Ragn-Sellsforetagen AB. Method and an arrangement for purifying and recovering heat energy from flue gases from refuse incineration. 4,682,549, Cl. 110-345.000.

Hall, Leslie C., Jr.; Meyer, David L.; and Wolfe, Brian A., to AMP Incorporated. Cable harness assembly apparatus. 4,682,391, Cl. 29-33.00M.

Hall, Marvin Z. Deadbolt lock. 4,682,482, Cl. 70-129.000.

Hall, Robert J.; Hall, George R.; and Cookerly, Jack C. Accompaniment note selection method. 4,682,526, Cl. 84-1.030.

Hallberg, Rolf O.; and Martinell, Rudolf H. Process for decreasing the nitrate content in water. 4,683,064, Cl. 210-605.000.

Hallgren, Robert. Current-steering digital-to-analog converter for providing bi-directional currents through a load. 4,683,458, Cl. 340-347.0DA.

Halliburton Company: *See—*
Wienck, Dennis A.; and Mints, Danny K., 4,682,506, Cl. 73-863.540.

Hamada, Takayoshi: *See—*
Onizuka, Masakazu; Tatani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, 4,683,210, Cl. 436-50.000.
Onizuka, Masakazu; Tatani, Atsushi; and Hamada, Takayoshi, 4,683,211, Cl. 436-50.000.

Hamaguchi, Setsunori; and Hanaoka, Sumio, to Kurosaki Refractories Co., Ltd. Method for application of refractory spray material. 4,683,151, Cl. 427-397.800.

Hamill, Robert L.; and Yao, Raymond C., to Eli Lilly and Company. Antibiotic A80190-producing actinomadura obligospora and process. 4,683,201, Cl. 435-75.000.

Hamilton, James W., Jr.; and Long, Edward A., to General Electric Company. Synchronous motor protection. 4,683,411, Cl. 318-706.000.

Hampton, Edward J.: *See—*
Porowski, Jan S.; O'Donnell, William J.; Badlani, Manu L.; and Hampton, Edward J., 4,683,014, Cl. 148-131.000.

Hanaki, Akira: *See—*
Iwamoto, Tadashi; Ikeda, Toshiki; Yukitomo, Kazuo; Hattori, Masaichi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, 4,683,403, Cl. 315-83.000.

Hanami, Osamu: *See—*
Inoue, Akira; Nomura, Shinichi; and Hanami, Osamu, 4,683,408, Cl. 318-696.000.

Hanamori, Ryoichi; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Lens barrel incorporating a motor. 4,682,854, Cl. 350-255.000.

Hanaoka, Sumio: *See—*
Hamaguchi, Setsunori; and Hanaoka, Sumio, 4,683,151, Cl. 427-397.800.

Hand, George E.; and Kramer, Roman A., to Interplastic Corporation. Process of making a dunnage rack. 4,683,097, Cl. 264-268.000.

Handler, Milton E.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Tool holder. 4,682,698, Cl. 211-70.600.

Hanin, Jean A.; and Verrier, Pierre E., to Exxon Research & Engineering Co. Ether-containing mixtures in flexible PVC. 4,683,343, Cl. 568-594.000.

Hanneken, Robert L. Corner and in-line fence post stress and bracing system. 4,682,761, Cl. 256-36.000.

Hansen, Eckard, to Provenda Marketing AG. Tilting seat and back chair, particularly tilting desk chair. 4,682,814, Cl. 297-300.000.

Hanssler, Gerd: *See—*
Salzburg, Herbert; Hajek, Manfred; Hanssler, Gerd; and Kuck, Varl-Heinz, 4,683,233, Cl. 514-253.000.

Hanulec, Joseph, to ISC Cardion Electronics, Inc. Phase controlled frequency division multiplexed communications system. 4,683,565, Cl. 370-69.100.

Haraichi, Satoshi: *See*—
Shimase, Akira; Yamaguchi, Hiroshi; Haraichi, Satoshi; and Miyauchi, Tateoki, 4,683,378, Cl. 250-492.200.

Harbridge, John B., to Beecham Group, p.l.c. Deadcat reaction for making 9-deoxy-9-isocyanato clavulanates. 4,683,300, Cl. 540-348.000.

Hardy, James E.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; and Lyon, Richard K., 4,682,468, Cl. 60-39.020.

Hares, George B.; and Morse, David L., to Corning Glass Works. Method of producing a composite body. 4,683,168, Cl. 428-335.000.

Hargreaves, Rodney B.: *See*—
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian G., 4,683,232, Cl. 514-228.000.

Hariki, Kazuo, to Kabushiki Kaisha Fujikoshi. Method of teaching an operation program to a line robot wherein a master robot positioned at a location remote from said line robot is first taught the program. 4,683,544, Cl. 364-513.000.

Harmer, Alan L., to Stanley Electric Co., Ltd. Refractometer for measuring the refractive index of a liquid. 4,682,889, Cl. 356-135.000.

Harold Simpson, Inc.: *See*—
Simpson, Harold G.; and Neyer, Leo E., 4,682,454, Cl. 52-200.000.

Harris, Bob. Bowlers' hand-drying bag. 4,682,422, Cl. 34-9.000.

Harris Corporation: *See*—
Schrantz, Gregory A., 4,683,485, Cl. 357-22.000.

Harris, Richard M.; and Abramczyk, Richard F., to Republic Steel Corporation. Eddy current flaw detector method and apparatus having a rotatable high permeability flux concentrator encircling a workpiece. 4,683,430, Cl. 324-241.000.

Hart, William D.: *See*—
Todd, Christian A.; and Hart, William D., 4,682,993, Cl. 55-314.000.

Harte, Kenneth J.; and Langner, Guenther O., to Control Data Corporation. All electrostatic electron optical sub-system for variable electron beam spot shaping and method of operation. 4,683,366, Cl. 219-121.0ER.

Harth, George H., III; Zolton, Gregory P., II; and Copen, Robert L., to Babcock & Wilcox Company, The. High temperature pressure vessel inspection procedure. 4,682,397, Cl. 29-407.000.

Hartleben, Harold A.: *See*—
Choy, Terrence A.; and Hartleben, Harold A., 4,682,969, Cl. 446-279.000.

Hartlepp, Karl H., to Kosan Crisplant A/S. Feeding conveyor for feeding articles laterally onto another conveyor, particularly a sorting conveyor. 4,682,682, Cl. 198-368.000.

Hartman, Thomas W.; and Ryan, Thomas G., to Cyclops Corporation. Cellular flooring system and method of using same. 4,682,456, Cl. 52-221.000.

Hartmann, Hans J., to ACS Industries, Inc. Compacted wire seal and method of forming same. 4,683,010, Cl. 148-6.350.

Hartmann, Joel; and Jeuch, Pierre, to Commissariat a l'Energie Atomique. Method for interconnecting the active zones and gates of CMOS integrated circuits. 4,682,403, Cl. 29-571.000.

Hartwig, Manfred; and Rausch, Georg, to Mannesmann Rexroth GmbH. Hydraulically operated self-closing two-way seat-type valve. 4,682,756, Cl. 251-63.500.

Haruno, Kiyoshi: *See*—
Iida, Koujirou; Yoshioka, Yasuo; Ogawa, Hiroshi; Haruno, Kiyoshi; and Ohigashi, Tsugio, 4,682,768, Cl. 271-3.100.

Haruta, Masahiro: *See*—
Eguchi, Ken; Matsuda, Hiroshi; Haruta, Masahiro; Nishimura, Yukuo; Hirai, Yutaka; and Nakagiri, Takashi, 4,683,147, Cl. 427-54.100.
Hirai, Yutaka; Matsuda, Hiroshi; Eguchi, Ken; Haruta, Masahiro; Nishimura, Yukuo; and Nakagiri, Takashi, 4,683,146, Cl. 427-54.100.
Nishimura, Yukuo; Eguchi, Ken; Matsuda, Hiroshi; Haruta, Masahiro; Hirai, Yutaka; and Nakagiri, Takashi, 4,683,144, Cl. 427-35.000.
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Hasal, Pavel: *See*—
Krovak, Premysl; Behunek, Vladimir; Vojtisek, Vladimir; Salvet, Miroslav; and Hasal, Pavel, 4,683,062, Cl. 210-617.000.

Hasenbalg, Ralph D. Automated keyboard testing. 4,682,695, Cl. 209-571.000.

Hashimoto Denki Co., Ltd.: *See*—
Takeda, Shigeki; and Maekawa, Sachio, 4,682,639, Cl. 144-2.00R.

Hashimoto, Shinichi: *See*—
Murakami, Reiji; Hashimoto, Shinichi; Shimono, Mamoru; and Ide, Fumito, 4,682,769, Cl. 271-10.000.

Hasselbach, Petra: *See*—
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,683,072, Cl. 252-102.000.

Hata, Katsuhiko; Ohashi, Hisao; Honda, Keiji; and Yamakami, Takahiko, to Sony Corporation. Method of manufacturing a cathode ray tube. 4,682,962, Cl. 445-5.000.

Hatabe, Yukio: *See*—
Komatsubara, Shoji; Hatabe, Yukio; Horikawa, Tooru; Murasawa, Sadao; and Murakami, Hajime, 4,682,881, Cl. 355-10.000.

Hattori, Masaichi: *See*—
Iwamoto, Tadashi; Ikeda, Toshiki; Yukitomo, Kazuo; Hattori, Masaichi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, 4,683,403, Cl. 315-83.000.

Hattori, Tadashi: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,682,496, Cl. 73-204.000.

Hauber, Peter. Ball bearing apparatus having snap fit feature. 4,682,901, Cl. 384-539.000.

Hauenstein, Alfred, to Siemens Aktiengesellschaft. Circuit for connecting a load to the high side of a DC power supply. 4,683,438, Cl. 323-288.000.

Haugland, James R., to Honeywell Inc. Radar transit time simulator device. 4,683,473, Cl. 342-172.000.

Hawkins, Gene: *See*—
Montgomery, Gary; and Hawkins, Gene, 4,682,700, Cl. 215-216.000.

Hayashi, Chikara; and Kashu, Seiichiro, to Research Development Corporation of Japan. Process and apparatus for manufacturing a pressed powder body. 4,683,118, Cl. 419-23.000.

Hayashi, Yoshinori: *See*—
Iijima, Kenzaburou; and Hayashi, Yoshinori, 4,683,013, Cl. 148-102.000.

Hayashima, Toshitaka: *See*—
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Uezu, Kazuo; Maehara, Hidejirou; and Momose, Masanori, 4,683,478, Cl. 346-76.0PH.

Hayes, Cecil: *See*—
Snowball, Malcolm R.; and Hayes, Cecil, 4,682,537, Cl. 99-282.000.

Hazenbroek, Jacobus E.; Verrijp, Bastiaan; and Wallbridge, William L., to Systemate B.V. Poultry breast filleting system. 4,682,386, Cl. 17-46.000.

Healey, Brian J., to Fiberlock Technologies, Inc. Shelter. 4,682,448, Cl. 52-63.000.

Health Research, Incorporated: *See*—
de Macario, Everly C.; Jovell, Robert J.; and Macario, Alberto J. L., 4,682,890, Cl. 356-244.000.
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Hean, Charles R.: *See*—
Knorowski, Victor J.; Hean, Charles R.; and Placek, Ronald J., 4,682,934, Cl. 416-198.00A.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Cyanate functional maleimide thermosetting composition. 4,683,276, Cl. 526-262.000.

Hegedus, Denes A.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,683,575, Cl. 372-59.000.

Hegner, Gunther: *See*—
Achtnig, Klaus-Peter; Herfort, Herrman; and Hegner, Gunther, 4,682,838, Cl. 439-598.000.

Heijnen, Johannes A., to Mead Corporation, The. Machine and method for setting-up basket style article carriers. 4,682,975, Cl. 493-123.000.

Heil-Quaker Corporation: *See*—
Bigham, Davis L., 4,682,579, Cl. 126-110.00R.

Heimbach, Glenn A. Method and tool for removing the nut which secures a faucet to a sink. 4,682,399, Cl. 29-426.400.

Heinen, Jochen, to Siemens Aktiengesellschaft. Semiconductor laser diode with buried hetero-structure. 4,683,574, Cl. 372-44.000.

Hell GmbH & Co.: *See*—
Hell, Uwe, 4,682,562, Cl. 118-500.000.

Hell, Uwe, to Hell GmbH & Co. Holding device for metal sections which are to be coated in two colors. 4,682,562, Cl. 118-500.000.

Helm, John L.; and Leonard, John S., to Proto-Power Corporation. Gas circulator for a nuclear reactor and a method for use thereof. 4,683,111, Cl. 376-391.000.

Heltman, Carolyn R. Protective eye patch. 4,682,371, Cl. 2-15.000.

Heltzel, James. Safety system for disabling a firearm. 4,682,435, Cl. 42-70.010.

Hemmes, Paul: *See*—
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,683,209, Cl. 436-14.000.

Hemrich, William R.: *See*—
Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., 4,683,369, Cl. 219-364.000.

Hendrickson, Gregory L. Trolling motor mount. 4,682,960, Cl. 440-53.000.

Hengstenberger, Gary M.; Montavon, John I.; and Fuller, David C., to Hengstenberger, Gary M.; and Montavon, John I. Safety harness. 4,682,671, Cl. 182-3.000.

Henkel Corp.: *See*—
Whyzmuzis, Paul D.; and Menke, John M., 4,683,262, Cl. 524-608.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,683,072, Cl. 252-102.000.
Moeller, Hinrich; and Wallat, Siegfried, 4,683,244, Cl. 514-568.000.

Henley, Lester P., to Regdon Solenoid, Inc. Bi-stable electromagnetic actuator. 4,683,452, Cl. 335-234.000.

Henry, John T. Pipe laying apparatus. 4,682,912, Cl. 405-154.000.

Henry Valve Company: *See*—
Krause, Richard J.; Gugala, Zbigniew H.; and Shah, Madhukant A., 4,683,057, Cl. 210-232.000.

Henslin, Frederick L.; and Perkins, Clarence. Splitting tool. 4,682,417, Cl. 30-294.000.

Henze, Siegfried: *See*—
Bierbaum, Joe; Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,682,555, Cl. 112-262.100.

Hepko, Samuel. High efficiency performance kinetic occlude system with rotary valve. 4,682,572, Cl. 123-80.0BB.

Herdeg, Donald F.; and Ciccia, Lawrence P., to USM Corporation. Displaceable apparatus for processing pallets in an automatic sewing machine. 4,682,552, Cl. 112-121.120.

Herfort, Herrman: *See—*
Achtnig, Klaus-Peter; Herfort, Herrman; and Hegner, Gunther, 4,682,838, Cl. 439-598.000.

Herro, Harvey M.: *See—*
Hunt, Barry E.; Herro, Harvey M.; Lee, Kyu-Hwa; and Mindick, Morris, 4,683,035, Cl. 204-1.00T.

Herzig, Frank: *See—*
Brenish, Michael; and Herzig, Frank, 4,682,383, Cl. 15-105.500.

Herzog-Hart Corporation: *See—*
Concordia, Joseph J.; and Hall, Donald R., 4,683,122, Cl. 422-227.000.

Hewlett-Packard Company: *See—*
Johnson, Samuel A., 4,683,481, Cl. 346-140.00R.

Hickory, Gordon E.: *See—*
Narayanan, Kesh S.; and Hickory, Gordon E., 4,682,988, Cl. 51-298.000.

Hida, Yoshinori; and Kozakai, Shohei, to Shin -Etsu Chemical Co., Ltd. Novel organopolysiloxane, method for the preparation thereof and composition containing the same. 4,683,320, Cl. 556-453.000.

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Takamiya, Kikuzo; and Hideyuki, Ishibashi, 4,682,509, Cl. 74-551.400.

Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., to Honeywell Inc. Microscopic size, thermal conductivity type, air or gas absolute pressure sensor. 4,682,503, Cl. 73-755.000.

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Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., 4,683,159, Cl. 428-138.000.

Higashi, Ryoji; and Nomura, Satoru, to Pioneer Electronic Corporation. Video disc type recording and reproducing system with interference reduction filter. 4,683,502, Cl. 358-342.000.

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Huang, Wann-Sheng; and Hight, Margaret A., 4,682,652, Cl. 166-263.000.

Higuchi, Kazuo; Sugama, Takayuki; Okuhara, Hisakazu; and Sasaki, Kiichi, to Honda Giken Kogyo Kabushiki Kaisha. Seat belt forwarding device. 4,682,789, Cl. 280-801.000.

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Miyoshi, Shuji; and Hijikigawa, Masaya, 4,682,502, Cl. 73-723.000.

Hildner, Knut, to Friedrichsfeld GmbH Keramik-und Kunststoffwerke. Connecting arrangement with a threaded sleeve. 4,682,797, Cl. 285-40.000.

Hill, Bryan H.: *See—*
Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson, Donald A., Jr., 4,683,532, Cl. 364-200.000.

Hill, Stephen A. Faucet system. 4,682,628, Cl. 137-624.110.

Hillier, Raymond G., to Delibes Pty. Ltd. Raw casting blank for fluid actuated ram assembly. 4,683,174, Cl. 428-583.000.

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Eguchi, Ken; Matsuda, Hiroshi; Haruta, Masahiro; Nishimura, Yukuo; Hirai, Yutaka; and Nakagiri, Takashi, 4,683,147, Cl. 427-54.100.
Nishimura, Yukuo; Eguchi, Ken; Matsuda, Hiroshi; Haruta, Masahiro; Hirai, Yutaka; and Nakagiri, Takashi, 4,683,144, Cl. 427-35.000.
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Hiramatsu, Shigeki: *See—*
Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, 4,682,518, Cl. 74-867.000.

Hirao, Katsumi; and Miyake, Toshio. Composition for sealing sliding contact section. 4,683,150, Cl. 427-239.000.

Hirasawa, Kazushige; Shimizu, Yasuhiro; and Matsumura, Takemasa, to Matsushita Electrical Industrial Co. Ltd. Time-based interpolation control of a robot. 4,683,543, Cl. 364-513.000.

Hirata, Makizo: *See—*
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Handler, Milton E.; Sylvan, Richard; and Peterson, Michael, 4,682,698, Cl. 211-70.600.

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Hitachi Control Systems, Inc.: *See—*
Takaki, Masaoki, 4,683,549, Cl. 364-900.000.

Hitachi Engineering Co., Ltd.: *See—*
Mochida, Takaaki; Yamashita, Junichi; Yoshioka, Toshiro; and Ozawa, Michihiro, 4,683,113, Cl. 376-419.000.

Hitachi, Ltd.: *See—*
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Itoh, Yoshitoshi; Mizuno, Katsuhiro; and Noguchi, Atomi, 4,682,845, Cl. 350-96.180.
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Hitchcock, William H., to Cooper Industries. Starting circuit and apparatus for high pressure sodium lamps. 4,683,404, Cl. 315-289.000.

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Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.

Ho, Shih-Ming; and Radford, Kenneth C., to Westinghouse Electric Corp. Burnable absorber-containing nuclear fuel pellets and formation of the same. 4,683,114, Cl. 376-419.000.

Hobbs, Monte O.: *See—*
Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl. 514-14.000.

Hodek, Robert B.; and Seiner, Jerome A., to PPG Industries, Inc. Process for the preparation of an organomagnesium compound. 4,683,344, Cl. 568-716.000.

Hodogaya Chemical Co., Ltd.: *See—*
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Hoechst Aktiengesellschaft: *See—*
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Kolkmann, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, 4,683,127, Cl. 423-321.00R.
Krakkay, Tibor; Poggi, Tatjana; and Schubert, Ernst, 4,483,286, Cl. 525-329.100.
Kressirer, Rudolf; and Oehler, Siegfried, 4,683,410, Cl. 318-696.000.

Hoefke, Wolfgang: *See—*
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Hoerenz, Peter G.; and Mueller, Gerhard, to Carl-Zeiss-Stiftung. Illuminance dosage device. 4,682,595, Cl. 128-303.100.

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Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,683,470, Cl. 340-771.000.

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Hoffmann-La Roche Inc.: *See—*
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Hogshead, Rodney C., III; and Van Duyne, Giles, Jr. Fastener for plastic film sheeting. 4,682,642, Cl. 160-392.000.

Hohl, Hans-Walter: *See—*
Gunther, Andreas; Malone, James R.; Lenthe, Manfred; and Hohl, Hans-Walter, 4,683,308, Cl. 544-211.000.

Hoholick, Joseph: *See—*
Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A., 4,683,138, Cl. 426-5.000.

Holdridge, David W., to Swedlow, Inc. Contoured transparency providing reduced optical distortion and method for making it. 4,682,856, Cl. 350-319.000.

Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, to Henkel Kommanditgesellschaft auf Aktien. Two-component cleaner and disinfectant tablet. 4,683,072, Cl. 252-102.000.

Hollaway, Gerald C., Jr., to Dayco Products, Inc. Polymeric composition and method of producing same. 4,683,270, Cl. 525-347.000.

Hollon, Blake D.: *See—*
Hollon, Edmund D.; and Hollon, Blake D., 4,682,910, Cl. 404-94.000.

Hollon, Edmund D.; and Hollon, Blake D. Marking system. 4,682,910, Cl. 404-94.000.

Holmes, Dorothy F.: *See*—
Coggins, Leroy; Murphy, Brian R.; Holmes, Dorothy F.; Anguish, Lynne J.; and Gillespie, James H., 4,683,137, Cl. 424-89.000.
Holmgren, Klas. Floor construction suitable for installation in rooms containing switchgear, computers, and like electrical apparatus, and a method for producing such a floor construction. 4,682,453, Cl. 52-126.200.
Holopainen, Weikko R. Ground piercing attachment for tractors. 4,682,659, Cl. 175-19.000.
Holtey, Thomas O.; Bruce, Kenneth E.; and Goss, Gary J., to Honeywell Information Systems Inc. Multiple color generation on a display. 4,683,466, Cl. 340-703.000.
Holy, Stephen M., to Arvidson, Joseph; Wells, Sharon K.; and Skoza, Thomas E. Collapsible, re-combinative martial-arts weapon. 4,682,774, Cl. 273-84.00R.
Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, to Knorr-Bremse AG. Electrically controlled brake for vehicles, especially rail vehicles. 4,682,823, Cl. 303-22.00R.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Nakajima, Toyohei; and Mieno, Toshiyuki, 4,683,049, Cl. 204-428.000.
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Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.
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Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, to Director-General of Agency of Industrial Science and Technology; and Showa Denko Kabushiki Kaisha. Laser-light absorber and method for absorbing laser light. 4,682,855, Cl. 350-276.00R.
Honegger, Werner, to Ferag AG. Apparatus for unwinding flexible flat products, especially printed products, arriving continuously, especially in imbricated formation. 4,682,741, Cl. 242-55.000.
Honeywell Inc.: *See*—
Atherton, Jay W.; Castor, Raymond A.; Christie, Leonard F.; and Engerman, Robert C., 4,683,439, Cl. 330-10.000.
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Hopkins, Thomas M., II: *See*—
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Horikawa, Tooru: *See*—
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Horn, Glenn T.: *See*—
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Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., to Forsythe Cosmetic Group, Ltd. Titanium dioxide dispersions and processes for their production. 4,683,007, Cl. 106-308.00M.
Hosaka, Akio, to Nissan Motor Co., Ltd. Power train control method for slip prevention. 4,682,667, Cl. 180-197.000.
Hoshino, Shigeru; and Miyata, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for detecting a steering angle and a steering angular velocity. 4,683,375, Cl. 250-231.0SE.
Hosoya, Jun, to Canon Kabushiki Kaisha. Projection lens. 4,682,861, Cl. 350-432.000.
Hossner, Klaus: *See*—
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Houghten, Richard: *See*—
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Houghten, Richard A.: *See*—
Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl. 514-14.000.
House, Marshall K., to Cascade Corporation. Lift truck clamp for handling stacked loads of different sizes. 4,682,931, Cl. 414-623.000.
Huang, Ken T.: *See*—
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Huang, Wann-Sheng; and Hight, Margaret A., to Texaco Inc. Producing hydrocarbons through successively perforated intervals of a horizontal well between two vertical wells. 4,682,652, Cl. 166-263.000.
Huard, Jean-Francois, to Tunzini Nessi Entreprises d'Equipements. Coupling device for tubes, tubular elbows and end plates of thermoelectric devices. 4,682,472, Cl. 62-3.000.
Hubble, Terence H., to P & H Enterprises Limited (Musical Products). Protective cover for window sills. 4,682,451, Cl. 52-97.000.
Hughes Aircraft Company: *See*—
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Macaulay, Malcolm; and Singleton, William F., 4,683,467, Cl. 340-705.000.
Stadnick, Steven J.; and Rogers, Howard H., 4,683,178, Cl. 429-101.000.
Welner, Jerome M., 4,682,888, Cl. 356-73.000.
Hughes, Philip M.; and McHugh, Michael W. Drilling apparatus. 4,682,661, Cl. 175-215.000.
Hulek, Anton, to Voest-Alpine. Continuous casting mold for selectively casting strands of different widths and thicknesses and a method for operating the continuous casting mold. 4,682,646, Cl. 164-481.000.
Hummel, Heinz P., to Leybold-Heraeus GmbH. Process and apparatus for measuring differences in the concentrations of paramagnetic components of gases. 4,683,426, Cl. 324-204.000.
Humphries, John; and Morrison, Neil S., to United Kingdom Atomic Energy Authority. Cold trap apparatus. 4,683,056, Cl. 210-186.000.
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Hunt, Barry E.; Herro, Harvey M.; Lee, Kyu-Hwa; and Mindick, Morris, to Nalco Chemical Company. Method for in situ corrosion detection using electrochemically active compounds. 4,683,035, Cl. 204-1.00T.
Hunter, Robert F. Animal trap. 4,682,440, Cl. 43-61.000.
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Hurst, James: *See*—
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Hurten, Oskar; Vogt, Hans; and Stutenkemper, Paul, to Ford Motor Company. Motor vehicle body side wall. 4,682,812, Cl. 296-195.000.
Hurumoto, Kunihiro: *See*—
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Hurwitz, James D. Internal lid for a liquid container. 4,682,705, Cl. 220-93.000.
Husky Injection Molding Systems Ltd.: *See*—
Schad, Robert D., 4,682,945, Cl. 425-549.000.
Huss, Heinrich. Car body. 4,682,809, Cl. 296-31.00P.
Hydro-Quebec: *See*—
Armand, Michel; Chabagno, Jean-Michel; Ricoux, Philippe; Vassort, Guy; Gauthier, Michel; Brochu, Fernand; and Rigaud, Philippe, 4,683,181, Cl. 429-192.000.
Drouet, Michel G., 4,683,367, Cl. 219-121.0PY.
Hynes, Martin D., to Eli Lilly and Company. Analgesic method. 4,683,235, Cl. 514-282.000.
Ichikoh Engineering, Ltd.: *See*—
Hachisu, Kiyoji, 4,682,930, Cl. 414-589.000.
ICI Americas Inc.: *See*—
Kirkland, Karin M.; and Mant, Derrick M., 4,683,228, Cl. 514-211.000.
ICT Integrated Circuit Testing Gesellschaft, fuer Halbleiterpruftechnik mbH: *See*—
Feuerbaum, Hans-Peter, 4,683,376, Cl. 250-309.000.
Ide, Fumito: *See*—
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Idota, Yoshio; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Toners for silver halide diffusion transfer image with sulfo or carboxyl groups. 4,683,189, Cl. 430-248.000.
Ienaga, Kazuharu; Nakamura, Ko; and Ishii, Akira, to Nippon Zoki Pharmaceutical Co., Ltd. Pharmaceutical composition containing an imidazolidinetrione derivative or pharmaceutically acceptable salt thereof. 4,683,240, Cl. 514-390.000.
Igarashi, Tsutomu: *See*—
Takeda, Kazuma; and Igarashi, Tsutomu, 4,683,462, Cl. 340-571.000.
Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, to Fuji Photo Film Co., Ltd. Process for producing silver halide photographic emulsion. 4,683,193, Cl. 430-570.000.
Iida, Koujirou; Yoshioka, Yasuo; Ogawa, Hiroshi; Haruno, Kiyoshi; and Ohigashi, Tsugio, to Matsushita Electric Industrial Co., Ltd. Bill receiving/dispensing apparatus. 4,682,768, Cl. 271-3.100.
Iijima, Kenzaburou; and Hayashi, Yoshinori, to Nippon Gakki Seizo Kabushiki Kaisha. Method for producing a shadow mask for a color cathode ray tube. 4,683,013, Cl. 148-102.000.
Iijima, Takashi: *See*—
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Iizuka, Tetsuya: *See*—
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Ikeda, Hiroki; and Takanashi, Nobuaki, to NEC Corporation. Joint assembly movable like a human arm. 4,683,406, Cl. 318-568.000.
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Immunetech, Inc.: *See*—
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Imori, Hideo; and Adachi, Katsumi, to Mitsubishi Denki Kabushiki Kaisha. Terminal structure for an automotive AC generator. 4,683,390, Cl. 310-71.000.
Imperial Chemical Industries Limited: *See*—
Leigh, Thomas, 4,683,089, Cl. 260-501.160.
Imperial Chemical Industries PLC: *See*—
Brown, David; Dowell, Robert I.; Hargreaves, Rodney B.; and Main, Brian G., 4,683,232, Cl. 514-228.000.
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,683,310, Cl. 546-321.000.
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Inaba, Yutaka: *See*—
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Ing. C. Olivetti & C., S.p.A.: *See*—
Cantello, Giuseppe; and Concari, Severino, 4,683,504, Cl. 360-78.000.
Carena, Ugo; Coli, Giuseppe; and Fogaroli, Giuseppe, 4,683,501, Cl. 358-293.000.
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Inoue, Akio; and Tanabe, Tsuneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Acrylonitrile polymer film and process for preparing same. 4,683,261, Cl. 524-566.000.
Inoue, Akira; Nomura, Shinichi; and Hanami, Osamu, to Seiko Seiki Kabushiki Kaisha. Stepping motor control apparatus. 4,683,408, Cl. 318-696.000.
Inoue, Kiyoshi; and Nose, Yoshiharu, to Nippon Oil Co., Ltd. Method for producing alkaline earth metal borate dispersions. 4,683,126, Cl. 423-280.000.
Inoue, Koi; Go, Youki; and Naeki, Yoshihiro, to Daiwa Seiko Inc. Fishingline guide for fishing rod. 4,682,439, Cl. 43-24.000.
Inoue, Shunichi: *See*—
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Intamin Corporation: *See*—
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Intel Corporation: *See*—
Leonov, Mark, 4,682,396, Cl. 29-271.000.
Interatom GmbH: *See*—
Neuelmann, Rolf; and Fortmann, Manfred, 4,683,419, Cl. 324-64.000.
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Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,683,470, Cl. 340-771.000.
DeGroot, Richard D., 4,683,547, Cl. 364-748.000.
Himelstein, Carol S.; and Wang, John S., 4,683,468, Cl. 340-709.000.
Itoh, Masaharu; Yokemura, Taketoshi; and Yanagisawa, Hiroshi, 4,682,869, Cl. 358-260.000.
Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., 4,683,505, Cl. 360-98.000.
International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Liberman, Arthur L., 4,683,342, Cl. 568-464.000.
Internationale Octrooi Maatschappij "Octropa" BV: *See*—
Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., 4,683,088, Cl. 260-409.000.
Interplastic Corporation: *See*—
Hand, George E.; and Kramer, Roman A., 4,683,097, Cl. 264-268.000.
Intersil, Inc.: *See*—
Snow, Dane R.; and Bingham, David, 4,683,528, Cl. 363-21.000.
Intevep, S.A.: *See*—
Rivas, Olegario, 4,682,655, Cl. 166-369.000.
Inuzuka, Hideo: *See*—
Emoto, Masami; Gotoh, Hiroshi; and Inuzuka, Hideo, 4,683,559, Cl. 369-44.000.
Irving, Arlillian. Clothes drying apparatus. 4,682,424, Cl. 34-151.000.
Irwin Company, The: *See*—
Williams, A. Graves, III; and Thackston, Ronald L., 4,682,917, Cl. 408-212.000.
ISC Cardion Electronics, Inc.: *See*—
Hanulec, Joseph, 4,683,565, Cl. 370-69.100.
Iscar Ltd.: *See*—
Teets, Bradley, 4,682,420, Cl. 33-626.000.
Ishibashi, Jiro: *See*—
Goto, Sumio; Ishibashi, Jiro; and Nemoto, Masakazu, 4,682,554, Cl. 112-262.100.
Ishihama, Toshio: *See*—
Ofusa, Masaatsu; and Ishihama, Toshio, 4,682,635, Cl. 139-116.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Komatsubara, Shoji; Hatabe, Yukio; Horikawa, Tooru; Murasawa, Sadao; and Murakami, Hajime, 4,682,881, Cl. 355-10.000.
Ishihara, Takafumi: *See*—
Cho, Hidetsura; Aisaka, Kazuo; Sato, Fumio; and Ishihara, Takafumi, 4,683,234, Cl. 514-256.000.
Ishihara, Tamio: *See*—
Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, 4,683,480, Cl. 346-134.000.
Ishii, Akira: *See*—
Ienaga, Kazuharu; Nakamura, Ko; and Ishii, Akira, 4,683,240, Cl. 514-390.000.
Ishii, Kunio; and Shibata, Tohru, to Daicel Chemical Industries, Ltd. Optical resolution of oxycyclopentenone. 4,683,341, Cl. 568-366.000.
Ishii, Yoshihiro: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,682,743, Cl. 242-58.600.
Ishikawa, Hidehiko; Matsuura, Kazuo; and Misaki, Hideo, to Toyo Jozo Kabushiki Kaisha. Novel maltose dehydrogenase, process for its production, and analytical method using the same. 4,683,198, Cl. 435-22.000.
Ishikawa, Kenji: *See*—
Kasai, Masaaki; and Ishikawa, Kenji, 4,682,703, Cl. 215-247.000.
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, to Miles Laboratories, Inc. Viability test device. 4,683,209, Cl. 436-14.000.
Isonaga, Touichi: *See*—
Kutsumura, Shoji; and Isonaga, Touichi, 4,683,031, Cl. 202-227.000.
Israel Aircraft Industries Ltd.: *See*—
Stoler, Arie, 4,683,356, Cl. 200-61.930.
ITI/CLM Impianti Tecnici Industriali SpA: *See*—
Cicin-Sain, Ivo, 4,682,428, Cl. 37-104.000.
Ito, Hiroshi: *See*—
Okada, Mitsuhiko; and Ito, Hiroshi, 4,682,519, Cl. 74-868.000.
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Kakii, Toshiaki; Matsuno, Koichiro; Kawada, Osamu; Ito, Ryozo; and Nakamura, Eiji, 4,682,864, Cl. 350-511.000.
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, to Mitsui Toatsu Chemicals, Incorporated. Agent for absorbing and releasing water vapor. 4,683,258, Cl. 524-434.000.
Itoh, Hiroshi: *See*—
Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, 4,682,518, Cl. 74-867.000.
Itoh, Masaharu; Yokemura, Taketoshi; and Yanagisawa, Hiroshi, to International Business Machines Corporation. Image processing system and method. 4,682,869, Cl. 358-260.000.
Itoh, Yoshitoshi; Mizuno, Katsuhiro; and Noguchi, Atomi, to Hitachi, Ltd. Apparatus for transmitting optical image. 4,682,845, Cl. 350-96.180.
ITT Corporation: *See*—
Elsmore, Jeff; Stoorza, Kenneth W.; and Walker, Timothy A., 4,683,469, Cl. 340-723.000.
White, John S.; Vaughan, A. Dahlgren; and Akers, Francis L., 4,682,850, Cl. 350-96.230.
ITT Industries, Inc.: *See*—
Mlynek, Daniel, 4,683,548, Cl. 364-786.000.
Scovell, Peter D., 4,683,363, Cl. 219-10.55A.
ITW Ateco: *See*—
Freudenmann, Kurt; and Wiese, Heiner, 4,682,748, Cl. 248-73.000.
Iwai, Shingo: *See*—
Suzuki, Ryozo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetuo, 4,682,936, Cl. 417-366.000.
Iwamoto, Tadashi; Ikeda, Toshiki; Yukitomo, Kazuo; Hattori, Masaichi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, to Mazda Motor Corporation. Dimmer passing device for headlamp of vehicle. 4,683,403, Cl. 315-83.000.
Iwasaki, Yukio: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,682,496, Cl. 73-204.000.
J. I. Case Company: *See*—
Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., 4,682,666, Cl. 180-89.130.
Jac Jacobsen A/S: *See*—
Krogsrud, Jens C.; and Sorensen, Kai O., 4,683,526, Cl. 362-346.000.

Jahnke, Serge, to Framatome & Cie. Wiring installation above the cover of a nuclear reactor vessel for connection of electric devices. 4,683,106, Cl. 376-259.000.

James, Steven D.: *See*—
Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.

Janke, Donald E., to Whirlpool Corporation. Temperature responsive baffle control circuit for a refrigerator. 4,682,474, Cl. 62-187.000.

Jansen-Herfeld, Roettger, to Richard Jansen GmbH. Hydraulic saw frame with external sealing means. 4,682,525, Cl. 83-751.000.

Janssen, John E., to Honeywell Inc. Method and apparatus for measuring a varying parameter. 4,682,898, Cl. 374-179.000.

Janssen, Peter J.: *See*—
Grassens, Leonardus J.; and Janssen, Peter J., 4,683,520, Cl. 361-427.000.

Japan Atomic Energy Research Institute: *See*—
Nagashima, Akira; and Sukegawa, Osamu, 4,683,576, Cl. 372-98.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., 4,683,280, Cl. 528-71.000.

Jaqua, Vance W.: *See*—
Feight, Robert A.; Jaqua, Vance W.; and Trom, Joseph, Jr., 4,682,779, Cl. 277-34.300.

Jarrett, Steven M.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,683,575, Cl. 372-59.000.

Jarry, Philippe; Haji, Mohamed L.; Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, to U.S. Philips Corporation. Vitreous semiconductor supporting structure and device realized with such a structure. 4,683,163, Cl. 428-209.000.

Jaswa, Vilay C.: *See*—
Bedard, James F.; and Jaswa, Vilay C., 4,683,570, Cl. 371-36.000.

Javeri, Rupin J., to Motorola, Inc. Frequency subtractor. 4,683,437, Cl. 328-133.000.

Jean, San B. Massage-functional pedal structure. 4,682,771, Cl. 272-73.000.

Jeffers, Frederick J.; and Simonds, John L., to Eastman Kodak Company. Magneto-resistive head with reduced thermal noise. 4,683,508, Cl. 360-113.000.

Jentry, Danny R. Quick attach and release base. 4,682,561, Cl. 114-363.000.

Jett, Thomas M., Jr. Ammunition round. 4,682,545, Cl. 102-430.000.

Jeuch, Pierre: *See*—
Hartmann, Joel; and Jeuch, Pierre, 4,682,403, Cl. 29-571.000.

Jewett, Walter L.: *See*—
Ernst, M. Eric; and Jewett, Walter L., 4,682,719, Cl. 224-310.000.

Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., to Burr-Brown Corporation. Personal computer instrumentation system including carrier board having bus-oriented plug-in instrumentation modules. 4,683,550, Cl. 364-900.000.

Jochem, Cornelis M. G.: *See*—
Broer, Dirk J.; Zwiers, Renso J. M.; and Jochem, Cornelis M. G., 4,682,853, Cl. 350-128.000.

John D. Hollingsworth on Wheels, Inc.: *See*—
Pinto, Akiva, 4,682,388, Cl. 19-105.000.

John Davis & Son (Derby) Limited: *See*—
Moore, Robert H.; and Morgan, Paul, 4,682,847, Cl. 350-96.200.

John Zink Company: *See*—
Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., 4,683,369, Cl. 219-364.000.

Johnson, Alan R.; and Yawberg, Richard C., to Owens-Corning Fiberglas Corporation. Methods of making glass wool blowing insulation. 4,682,523, Cl. 83-19.000.

Johnson, Donald K.: *See*—
Green, Kenneth E.; Johnson, Donald K.; and Woodruff, Roger W., 4,682,568, Cl. 122-235.00C.

Johnson, Douglas W. Adjustable breast bridge for use in multiple-plane interstitial breast implants. 4,682,593, Cl. 128-303.00R.

Johnson, Gerald T., Sr. Swather with swinging hitch. 4,682,462, Cl. 56-228.000.

Johnson Matthey & Company, Limited: *See*—
Selman, Gordon L.; and Midgley, Richard J., 4,683,119, Cl. 420-444.000.

Johnson, Pierce, Jr., to GTE Products Corporation. Compact incandescent coiled coil filament. 4,683,397, Cl. 313-344.000.

Johnson, Robert G.: *See*—
Bohrer, Philip J.; Higashi, Robert E.; and Johnson, Robert G., 4,683,159, Cl. 428-138.000.
Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.

Johnson, Samuel A., to Hewlett-Packard Company. Thermal ink jet common-slotted ink feed printhead. 4,683,481, Cl. 346-140.00R.

Jona, Mario, to Campagnolo S.p.A. Toe clip for bicycle pedals. 4,682,514, Cl. 74-594.600.

Jones, Franklin B.; Milberger, Walter E.; and Kerfoot, Charles S., to United States of America, Air Force. Quadrature switch apparatus for multi mode phase shift drivers. 4,683,387, Cl. 307-571.000.

Jones, Norman S., to Pneupac Limited. Resuscitator/ventilator. 4,682,591, Cl. 128-204.250.

Jones, Stanley P.: *See*—
Foster, Thomas V.; Jones, Stanley P.; and Alderson, David L., 4,682,996, Cl. 65-25.100.

Jones, Thomas H.: *See*—
MacDonald, Daniel J.; and Jones, Thomas H., 4,683,392, Cl. 310-105.000.

Jordan, Chalmer; Connor, Lee; and Lybarger, Robert, to Saegertown Manufacturing Corporation. Spike forming method. 4,682,381, Cl. 10-63.000.

Joseph Galkin Corporation: *See*—
Block, Charles, 4,682,556, Cl. 112-265.100.

Josey, Alden D., to Du Pont de Nemours, E. I., and Company. Process for the nucleophilic substitution of unactivated aromatic and heteroaromatic substrates. 4,683,091, Cl. 260-543.00R.

Jovell, Robert J.: *See*—
de Macario, Everly C.; Jovell, Robert J.; and Macario, Alberto J. L., 4,682,890, Cl. 356-244.000.
de Macario, Everly C.; Jovell, Robert J.; and Macario, Alberto J. L., 4,682,891, Cl. 356-244.000.

Joy Manufacturing Company: *See*—
Shelton, William S., 4,682,757, Cl. 251-77.000.

Joy, Stanley E. Hand-held apparatus and method for loosening, aerating and fertilizing soil plant roots. 4,682,550, Cl. 111-7.100.

Judes, Avie: *See*—
Beihoff, Bruce C.; Judes, Avie; and Baran, Michael S., 4,683,515, Cl. 361-106.000.

Judge, Edward E., Jr.: *See*—
Judge, Norman R.; Judge, Edward E., Jr.; and Reiser, Arthur G., 4,682,444, Cl. 51-154.000.

Judge, Norman R.; Judge, Edward E., Jr.; and Reiser, Arthur G., to Industrial Metal Products Corporation. Microfinishing apparatus and method. 4,682,444, Cl. 51-154.000.

Jungkind, Roland, to adidas Sportschuhfabriken Adi Dassler Stiftung & Co. KG. Cross-country ski binding. 4,682,785, Cl. 280-615.000.

Jursich, Donald N.: *See*—
Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., 4,683,369, Cl. 219-364.000.

Kabushiki Kaisha Fujikoshi: *See*—
Hariki, Kazuo, 4,683,544, Cl. 364-513.000.

Kabushiki Kaisha Kaneda Kikai Seisakusho: *See*—
Watanabe, Takemi; and Shiba, Noriyuki, 4,683,022, Cl. 156-505.000.

Kabushiki Kaisha Tamura Seisakusho: *See*—
Masuda, Tsugunori; and Muto, Shoji, 4,682,563, Cl. 118-503.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.

Kabushiki Kaisha Toshiba: *See*—
Koshino, Masayoshi, 4,683,394, Cl. 310-313.00R.
Matsunaga, Yoshiyuki, 4,683,580, Cl. 377-60.000.
Murakami, Reiji; Hashimoto, Shinichi; Shimono, Mamoru; and Ide, Fumito, 4,682,769, Cl. 271-10.000.
Nakatsugawa, Norihiko, 4,683,460, Cl. 340-545.000.
Okazaki, Yukio, 4,683,401, Cl. 315-39.000.
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,683,382, Cl. 307-296.00R.
Sasaki, Hiroshi, 4,682,497, Cl. 73-602.000.

Kaelin, G. Robert: *See*—
Young, James P.; Weber, Robert J.; and Kaelin, G. Robert, 4,683,443, Cl. 330-277.000.

Kaeseler, Werner. Method for reconditioning spot welding electrodes. 4,682,487, Cl. 72-354.000.

Kaesler, Ralph W.: *See*—
Rose, Gerard R.; Kaesler, Ralph W.; and Fong, Dodd W., 4,683,066, Cl. 210-734.000.

Kagan, Neil. Balancing figure toy building blocks. 4,682,966, Cl. 446-101.000.

Kageyama, Ryoichi: *See*—
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.

Kagstrom, Per-Olof; and Abrahamsson, Lars, to Granges Aluminium Aktiebolag. Method and apparatus for cleaning watery ventilating air containing liquids which have been gasified during cooling or lubrication of converting machines, particularly rolling mills. 4,682,990, Cl. 55-80.000.

Kahn, Manfred: *See*—
Rice, Roy W.; Kahn, Manfred; and Shadwell, Damian E., 4,683,161, Cl. 428-178.000.

Kaiser, Klaus-Peter: *See*—
Viertel, Lothar; and Kaiser, Klaus-Peter, 4,683,522, Cl. 362-135.000.

Kakii, Toshiaki; Matsuno, Koichiro; Kawada, Osamu; Ito, Ryozo; and Nakamura, Eiji, to Nippon Telegraph & Telephone Corporation; and Nippon Kogaku K.K. Method and apparatus for simultaneously observing a transparent object from two directions. 4,682,864, Cl. 350-511.000.

Kakiuchi, Shinichi; Saito, Tasuku; and Tomita, Seisuke, to Bridgestone Corporation. Rubber compositions for solid golf balls. 4,683,257, Cl. 524-432.000.

Kakushima, Masatoshi: *See*—
Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., 4,683,325, Cl. 560-10.000.

Kambayashi, Hiroaki; and Okada, Yasuyuki, to Hitachi, Ltd. System for on-line and off-line display. 4,683,552, Cl. 364-900.000.

Kamikawara, Toshio, to NEC Corporation. Electronic attenuation value control circuit in which switching noise is suppressed. 4,683,386, Cl. 307-549.000.

Kamio, Hideo: *See*—
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

Kammann, Karl P., Jr.; and Troxel, Kathleen A., to Ferro Corporation. Aqueous corrosion inhibitor compositions of a half-amide and a dicarboxylic acid amine salt. 4,683,081, Cl. 252-392.000.

Kanbe, Junichiro; Okada, Shinjiro; Takahashi, Tohru; and Ando, Yujiro, to Canon Kabushiki Kaisha. Liquid crystal device having reduced-pressure region in communication with ferroelectric liquid crystal. 4,682,858, Cl. 350-334.000.

Kaneda, Naoya: *See*—
Toyama, Masamichi; Kaneda, Naoya; and Fujibayashi, Kazuo, 4,682,886, Cl. 356-1.000.

Kaneda, Yutaka: *See*—
Miyoshi, Masato; Kaneda, Yutaka; and Ohga, Juro, 4,683,590, Cl. 381-71.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Maeda, Hirofumi; and Akamatsu, Naruhiko, 4,682,989, Cl. 55-23.000.

Kanehara, Kenji: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,682,496, Cl. 73-204.000.

Kanehira, Kenichi: *See*—
Kume, Hisao; Nishihara, Tokihiro; Shirasaka, Hiroharu; Kanehira, Kenichi; and Saita, Koji, 4,682,965, Cl. 445-37.000.

Kaneko, Takashi, to NEC Corporation. Pulse number detection circuit. 4,683,385, Cl. 307-518.000.

Kaneko, Toshio: *See*—
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.

Kanerva, Heikki: *See*—
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.

Kang, Kwon J. Process for manufacturing an herb tea from the leaves of Ginko, Persimmon and Pine. 4,683,140, Cl. 426-597.000.

Kanno, Yoshiaki; and Nishimura, Yukinobu, to Mitsubishi Denki Kabushiki Kaisha. Fuel control system for internal combustion engine. 4,683,539, Cl. 364-431.050.

Kano, Takenori: *See*—
Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, 4,682,534, Cl. 92-130.00R.

Kao, Ching-Ho. Multi-purpose building block. 4,682,967, Cl. 446-113.000.

Kappeler, Otmar, to Deutsche ITT Industries GmbH. Generator circuit for generating two sinusoidal signals with a phase difference of 90 degrees. 4,683,444, Cl. 331-25.000.

Kara, Stephen. Head and guide cleaning device for video tape recorder. 4,683,511, Cl. 360-132.000.

Karasawa, Akira: *See*—
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000. .

Kargetta, David J.: *See*—
Thomas, Bradley S.; and Kargetta, David J., 4,682,806, Cl. 294-88.000.

Karner, Gary M., to Atlantic Richfield Company. Control system for inclined impact-type surface seismic source. 4,683,558, Cl. 367-189.000.

Kasada, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Carburetion type burning apparatus. 4,682,946, Cl. 431-14.000.

Kasai, Masaaki; and Ishikawa, Kenji, to Terumo Kabushiki Kaisha. Stopper for medical container. 4,682,703, Cl. 215-247.000.

Kasai, Masaji: *See*—
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, to Fukutome Meat Packers, Ltd.; and Hitec Co., Ltd. Method and apparatus for automatically suspending sausages from a bar. 4,682,385, Cl. 17-45.000.

Kase, Hiroshi: *See*—
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

Kashiwa, Michiaki: *See*—
Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, 4,683,540, Cl. 364-468.000.

Kashu, Seiichiro: *See*—
Hayashi, Chikara; and Kashu, Seiichiro, 4,683,118, Cl. 419-23.000.

Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., to Westinghouse Electric Corp. Laser beam transport system. 4,683,365, Cl. 219-121.0LC.

Katakura, Kageyoshi: *See*—
Takeuchi, Hiroshi; Nakaya, Chitose; and Katakura, Kageyoshi, 4,683,396, Cl. 310-358.000.

Kataoka, Hiroshi. Device for taking out sheet rolls and mounting sheet roll cores. 4,682,929, Cl. 414-589.000.

Kato, Kenji; Inoue, Tokuta; Nakanishi, Kiyoshi; and Matsushita, Soichi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for reducing NOx in internal combustion engine. 4,682,577, Cl. 123-492.000.

Kato, Masayuki; Taguchi, Yoshio; Imai, Chihiro; and Makishima, Tokuo, deceased (by Makishima, Nobuko, legal representative), to Toa Nenryo Kogyo Kabushiki Kaisha. Methylstyrene maleimide copolymer. 4,683,275, Cl. 526-262.000.

Kato, Shigeru, to Pioneer Electronic Corporation. Noise reduction compression system controlled by compressed output components which are in-band. 4,683,449, Cl. 333-14.000.

Katoh, Itsurou, to Sharp Kabushiki Kaisha. Electrophotographic copier. 4,682,879, Cl. 355-3.000.

Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, to Kyowa Hakko Kogyo Co., Ltd. Method for transforming microorganisms. 4,683,205, Cl. 435-172.300.

Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho; and Toyota Jidosha Kabushiki Kaisha. Webbing retaining structure. 4,682,790, Cl. 280-801.000.

Katsuragawa Denki Kabushiki Kaisha: *See*—
Takizawa, Tatsuji; Noda, Nobutaka; and Takigawa, Hideaki, 4,682,878, Cl. 355-3.0FU.

Katz, Gary P. Tamper-proof container. 4,682,701, Cl. 215-230.000.

Kaufman, Vernon R.; and Geringer, Miles S., to Tecumseh Products Company. Exhaust gas recirculation system for crankcase scavenged two cycle engine. 4,682,571, Cl. 123-73.00A.

Kaulich, Franz, to Hoechst Aktiengesellschaft. Nonwoven for manufacturing flameproof roofing sheets. 4,683,164, Cl. 428-287.000.

Kawabata, Takashi: *See*—
Ohmura, Hiroshi; Tsunekawa, Tokuichi; Kiyohara, Shyuichi; and Kawabata, Takashi, 4,682,873, Cl. 354-478.000.

Kawada, Haruki: *See*—
Saito, Kenji; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nishimura, Yukuo; and Nakagiri, Takashi, 4,682,897, Cl. 374-45.000.

Kawada, Osamu: *See*—
Kakii, Toshiaki; Matsuno, Koichiro; Kawada, Osamu; Ito, Ryozo; and Nakamura, Eiji, 4,682,864, Cl. 350-511.000.

Kawamoto, Isao: *See*—
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,682,573, Cl. 123-90.200.

Kazaoka, Kenichi; Okazaki, Hiroshi; and Inaba, Yasuhisa, to Aisin Seiki Kabushiki Kaisha. Flexible mounting. 4,682,763, Cl. 267-89.000.

Kea, Sandra; Walker, Charles E.; and Kline, Eric, to Nebraska Department of Economic Development. Sugar esters and an improved anhydrous method of manufacture. 4,683,299, Cl. 536-119.000.

Kelch, Russell K.; Finfrock, Don C.; Girard, Donald J.; Seevers, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., to NCR Corporation. Polling method for data processing system. 4,683,531, Cl. 364-200.000.

Keller, Ron F., to GTE Government Systems Corporation. Method of extracting insulated wires from a shielded cable. 4,682,413, Cl. 29-825.000.

Kelley Company Inc.: *See*—
Bennett, Mark A., 4,682,382, Cl. 14-71.300.

Kemp, Charles W., to Canadian Corporate Management Co., Ltd. Load sensing systems for conveyor weigh scales. 4,682,664, Cl. 177-16.000.

Kenjyo, Hideyuki: *See*—
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,683,560, Cl. 369-45.000.

Kennecott Corporation: *See*—
Miller, John R., 4,683,516, Cl. 361-328.000.

Kerfoot, Charles S.: *See*—
Jones, Franklin B.; Milberger, Walter E.; and Kerfoot, Charles S., 4,683,387, Cl. 307-571.000.

Kerr, J. Russell: *See*—
Propp, Clarence E.; and Kerr, J. Russell, 4,682,452, Cl. 52-118.000.

Kerr, Jack R.; Dunsmore, Gerald L.; and Shelton, Thomas V. Self-locking nut device and method. 4,682,924, Cl. 411-329.000.

Kessler, Milton. Carrier with indicia mounting means. 4,682,692, Cl. 206-459.000.

Kessler, Ronald N.; and Ullman, Myron E., to Boardman Molded Products, Inc. Floating cap seal. 4,682,704, Cl. 215-329.000.

Keystone International, Inc.: *See*—
Scobie, William B.; and Wagberg, Michael L., 4,682,758, Cl. 251-84.000.

Kido, Yoshinobu; and Yamada, Toshihiro, to Mazda Motor Corporation. Shifting timing indicating system for a vehicle. 4,683,455, Cl. 340-52.00R.

Kihira, Koichi: *See*—
Iwamoto, Tadashi; Ikeda, Toshiki; Yukitomo, Kazuo; Hattori, Masaichi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, 4,683,403, Cl. 315-83.000.

Kim, Choung U., to Bristol-Myers Company. Carbapenem antibiotics. 4,683,301, Cl. 540-350.000.

Kim, Soo K., to Gold Star Co., Ltd. Device for variably adjusting a moment of inertia of a drum of a videocassette recorder. 4,683,512, Cl. 360-137.000.

Kimberly-Clark Corporation: *See*—
Floyd, David T.; Shanklin, Garry L.; Lynch, Gordon E.; and Meitner, Gary H., 4,683,001, Cl. 106-3.000.

Kimura, Shoichi, to Nohmi Bosai Kogyo Co., Ltd. Gas and fire alarm and control system for semiconductor factories or the like. 4,683,463, Cl. 340-629.000.

Kindlmann, Peter J.; and Lewis, Brian G., to Olin Corporation. Control system for electromagnetic casting of metals. 4,682,645, Cl. 164-453.000.

King, Eddie W.: *See*—
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 4,682,709, Cl. 221-2.000.

King, Halm C., Jr.; and King, Nancy. Utility insulated cross-arm. 4,682,747, Cl. 248-68.100.

King Instrument Corporation: *See*—
Woodley, George M.; and Bakes, William S., 4,682,742, Cl. 242-56.00R.

King, Nancy: *See*—
King, Halm C., Jr.; and King, Nancy, 4,682,747, Cl. 248-68.100.

King-Seeley Thermos Co.: *See*—
Nelson, Kenneth L., 4,682,475, Cl. 62-354.000.

Kinoshita, Tomohiro; Tanabe, Seiichi; and Sasakawa, Eishiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Power generation system in fuel cell. 4,683,177, Cl. 429-26.000.

Kinsman, Donald V.: *See*—
Luken, Clement H., Jr.; and Kinsman, Donald V., 4,682,947, Cl. 431-288.000.

Kioritz Corporation: *See*—
Nagashima, Akira, 4,682,830, Cl. 439-224.000.

Kipling, Graham V., to Diesel Equipment Limited. Modulator valve. 4,682,621, Cl. 137-116.300.

Kirkland, Karin M.; and Mant, Derrick M., to ICI Americas Inc.; and Imperial Chemical Industries PLC. Guanidinopyrazolylamides, guanidimoimidazolylamides, compositions containing them, and method of using them to inhibit gastric acid secretion. 4,683,228, Cl. 514-211.000.

Kishimoto, Keiichi: *See*—
Yoshitake, Makoto; and Kishimoto, Keiichi, 4,683,319, Cl. 556-425.000.

Kitamura, Hideaki; Fujiki, Syogo; and Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Method for reproducing picture image. 4,683,500, Cl. 358-280.000.

Kitamura, Nobuo: *See*—
Shimada, Satoshi; Kitamura, Nobuo; Shikakura, Kunio; and Maeda, Namio, 4,683,491, Cl. 358-56.000.

Kiyohara, Shyuichi: *See*—
Ohmura, Hiroshi; Tsunekawa, Tokuichi; Kiyohara, Shyuichi; and Kawabata, Takashi, 4,682,873, Cl. 354-478.000.

Klann, Horst. Device for pushing wheel flange hubs and splined flange hubs of motor vehicles out of a shaft bearing. 4,682,395, Cl. 29-261.000.

Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., to J. I. Case Company. Operator compartment assembly. 4,682,666, Cl. 180-89.130.

Kline, Eric: *See*—
Kea, Sandra; Walker, Charles E.; and Kline, Eric, 4,683,299, Cl. 536-119.000.

Klompenburg, Marlo V., to Rolscreen Company. Sliding window construction. 4,682,455, Cl. 52-207.000.

Knapp, Furn F., Jr.; Butler, Thomas A.; and Brihaye, Claude, to United States of America, Energy. Osmium-191/iridium-191m radionuclide. 4,683,123, Cl. 423-2.000.

Knecht, William R.: *See*—
Criscimagna, Tony N.; Hoffman, Harry S., Jr.; and Knecht, William R., 4,683,470, Cl. 340-771.000.

Knifton, John F.; and Grice, Neal J., to Texaco Inc. Catalytic process for the preparation of linear polyethylenepolyamines with tungstophosphoric acid-or molybdophosphoric acid-on-titania catalysts. 4,683,335, Cl. 564-480.000.

Knorowski, Victor J.; Hean, Charles R.; and Placek, Ronald J., to General Electric Company. Wheel anti-rotation means. 4,682,934, Cl. 416-198.00A.

Knorr-Bremse AG: *See*—
Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, 4,682,823, Cl. 303-22.00R.

Knuepfer, Wolfgang: *See*—
Haas, Werner; Knuepfer, Wolfgang; and Pfeiler, Manfred, 4,682,600, Cl. 128-328.000.

Kobayashi, Masashi, to Maruman Golf Co., Ltd. Device for measuring a stiffness of a golf-club shaft. 4,682,504, Cl. 73-854.000.

Kobayashi, Masatsune: *See*—
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.

Kobayashi, Sadao: *See*—
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

Kobayashi, Seishichi: *See*—
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,683,263, Cl. 525-57.000.

Kobayashi, Tomio: *See*—
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.

Kobayashi, Yuki: *See*—
Togino, Takayosi; Kobayashi, Yuki; and Yonekubo, Ken, 4,682,859, Cl. 350-414.000.

Kocanowski, Stephen: *See*—
Vaillancourt, Vincent L.; and Kocanowski, Stephen, 4,682,607, Cl. 128-772.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Wieland, Erich G., 4,682,542, Cl. 101-148.000.

Koga, Naoki: *See*—
Ueno, Shinji; and Koga, Naoki, 4,683,130, Cl. 423-579.000.

Kohama, Tokio: *See*—
Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,682,496, Cl. 73-204.000.

Kohl, Arthur L., to Rockwell International Corporation. Gasification of black liquor. 4,682,985, Cl. 48-197.00R.

Kohno, Hideki: *See*—
Yamamoto, Etsuji; Kohno, Hideki; Kuroda, Masao; Matsui, Shigeru; and Shiono, Hidemi, 4,683,433, Cl. 324-309.000.

Kohzato, Yasuo: *See*—
Sugiura, Susumu; and Kohzato, Yasuo, 4,683,492, Cl. 358-80.000.

Kojima, Teiryo; Matsuda, Heiichiro; and Tokizane, Masaru, to Toray Industries, Inc. False-twist textured yarn of polyamide. 4,682,465, Cl. 57-247.000.

Koleske, Joseph V.; and Domeier, Linda A., to Union Carbide Corporation. Compositions containing a reactive monomer derived from a lactone. 4,683,287, Cl. 528-357.000.

Kolkmann, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, to Hoechst Aktiengesellschaft. Process for making wet-process phosphoric acid. 4,683,127, Cl. 423-321.00R.

Kollmorgen Technologies Corporation: *See*—
Morrissey, Denis M.; Takach, Peter E.; and Zeblisky, Rudolph J., 4,683,036, Cl. 204-15.000.

Komatsubara, Shoji; Hatabe, Yukio; Horikawa, Tooru; Murasawa, Sadao; and Murakami, Hajime, to Dainippon Screen Mfg. Co., Ltd.; and Ishihara Sangyo Kaisha Ltd. Apparatus for producing an electrophotographic print. 4,682,881, Cl. 355-10.000.

Konishi, Masataka: *See*—
Tsunakawa, Mitsuaki; Konishi, Masataka; and Miyaki, Takeo, 4,683,230, Cl. 314-214.000.

Konomura, Yutaka, to Olympus Optical Co., Ltd. Basket forceps assembly for endoscope. 4,682,599, Cl. 128-328.000.

Konovalov, Viktor A.: *See*—
Bezborodov, Vladimir S.; Konovalov, Viktor A.; Ptashnikov, Jury L.; Astafiev, Vladimir M.; and Petrovich, Alexandr E., 4,683,079, Cl. 252-299.670.

Koroscil, Anthony; Smithey, Walter A.; and Delgado, Paul A., to American Cyanamid Company; and Del Manufacturing. Chemiluminescent light container. 4,682,544, Cl. 102-336.000.

Kortenbach & Rauh Kommanditgesellschaft: *See*—
Schultes, Tilmann, 4,682,616, Cl. 135-38.000.
Schultes, Tilmann; and Stiller, Klaus, 4,682,617, Cl. 135-38.000.

Kosan Crisplant A/S: *See*—
Hartlepp, Karl H., 4,682,682, Cl. 198-368.000.

Koshino, Masayoshi, to Kabushiki Kaisha Toshiba. Acoustic surface wave resonator device. 4,683,394, Cl. 310-313.00R.

Kossor, Michael G. Method and apparatus for controlling telephone line access. 4,683,583, Cl. 379-200.000.

Kothmann, Kody R. Method of inserting intramedullary coupled pin. 4,682,590, Cl. 128-92.0YZ.

Kowalchuk, William M., to Moore Business Forms, Inc. Hospital arm band. 4,682,431, Cl. 40-21.00C.

Kowata, Nobuo; and Sasano, Naoshige, to Showa Electric Wire & Cable Co. Ltd. Optical fiber junction and method of making same. 4,682,849, Cl. 350-96.220.

Kozakai, Shohei: *See*—
Hida, Yoshinori; and Kozakai, Shohei, 4,683,320, Cl. 556-453.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Fromel, Gustav; and Steinke, Alexander, 4,683,115, Cl. 376-439.000.
Goebel, Konrad; and Schiffers, Ulrich, 4,682,620, Cl. 137-110.000.

Krakkay, Tibor; Poggi, Tatjana; and Schubert, Ernst, to Hoechst Aktiengesellschaft. Polyacrylonitriles with a low K value, a process for their preparation and their suitable use. 4,683,286, Cl. 525-329.100.

Kramer, Roman A.: *See*—
Hand, George E.; and Kramer, Roman A., 4,683,097, Cl. 264-268.000.

Krane, Leonard. Apparatus and method for learning about the relationships and personalities of a group of two or more persons. 4,682,956, Cl. 434-237.000.

Kraus, Werner: *See*—
Baro, Gunter; Kraus, Werner; and Stindt, Wilfried, 4,683,107, Cl. 376-260.000.

Krause, Richard J.; Gugala, Zbigniew H.; and Shah, Madhukant A., to Henry Valve Company. Refillable filter-drier assembly. 4,683,057, Cl. 210-232.000.

Kreiskorte, Ing. H., to Thyssen Industrie AG. Surface testing apparatus. 4,682,498, Cl. 73-618.000.

Kress, Hans-Jurgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions consisting of polycarbonates, graft polymers and copolymers. 4,683,265, Cl. 525-67.000.

Kressirer, Rudolf; and Oehler, Siegfried, to Hoechst Aktiengesellschaft. Method for detecting step losses in stepping-motor-driven adjusting devices. 4,683,410, Cl. 318-696.000.

Kreuter, Peter. Electromagnetically-actuated positioning system. 4,682,574, Cl. 123-90.110.

Kreuzer, Helmut; and Meier, Klaus-Peter, to Robert Bosch GmbH. Process of making a dynamo electric machine. 4,682,410, Cl. 29-596.000.

Krogsrud, Jens C.; and Sorensen, Kai O., to Jac Jacobsen A/S. Asymmetric lamp. 4,683,526, Cl. 362-346.000.

KRONE GmbH: *See*—
Achtnig, Klaus-Peter; Herfort, Herrman; and Hegner, Gunther, 4,682,838, Cl. 439-598.000.

Krovak, Premysl; Behunek, Vladimir; Vojtisek, Vladimir; Salvet, Miroslav; and Hasal, Pavel, to Ceskoslovenska akademie ved. Method of circulation of a liquid phase through a solid phase particularly for biocatalytical reactions and a device for realization thereof. 4,683,062, Cl. 210-617.000.

Kubo, Kanji: *See*—
Shiozaki, Kenichi; and Kubo, Kanji, 4,683,533, Cl. 364-200.000.

Kubo, Seitoku: *See*—
Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, 4,682,534, Cl. 92-130.00R.

Kubota, Makoto: *See*—
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.

Kucera, Clare H., to Dowell Schlumberger Incorporated. Fracturing of subterranean formations. 4,683,068, Cl. 252-8.551.

Kuchar, Miroslav; Brunova, Bohumila; Grimova, Jaroslava; and Maturova, Eva, to Spofa spojene podniky pro zdravotnickou. Omega-(2,4-dihalobiphenylyl) oxo alkanoic acids. 4,683,331, Cl. 562-459.000.

Kuck, Varl-Heinz: *See*—
Salzburg, Herbert; Hajek, Manfred; Hanssler, Gerd; and Kuck, Varl-Heinz, 4,683,233, Cl. 514-253.000.

Kudo, Yoshio: *See*—
Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, 4,682,855, Cl. 350-276.00R.

Kuga, Kazuhiko; Washita, Hiroshi; and Watanabe, Hiroyuki, to Asahi Glass Company, Ltd. Laminate and method for its preparation. 4,683,171, Cl. 428-354.000.

Kukolja, Stjepan; and Wright, Walter E., to Eli Lilly and Company. Antibiotic derivatives of 7β-[2-(thiazol-4-yl)acetamide]-3-chloro-3-cephem-4-carboxylic acids and compositions and method of use thereof. 4,683,227, Cl. 514-202.000.

Kumano, Atsushi: *See*—
Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., 4,683,280, Cl. 528-71.000.

Kumazawa, Takahiro; Nakamura, Yoshihiro; and Yamaguchi, Yoshimitsu, to Nippondenso Co., Ltd. Method and device for removing defective products. 4,682,694, Cl. 209-559.000.

Kume, Hisao; Nishihara, Tokihiro; Shirasaka, Hiroharu; Kanehira, Kenichi; and Saita, Koji, to Sony Corporation. Method for manufacturing an electron beam selection electrode. 4,682,965, Cl. 445-37.000.

Kumura, Tatsuo: *See*—
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.

Kunkle, John P.; and McClune, Donald W., to AMP Incorporated. Surface mount socket for dual in-line package. 4,682,829, Cl. 439-83.000.

Kurama, Kenichiro; and Shibata, Michiyasu, to Mazda Motor Corporation; and Nippon Kokan Kabushiki Kaisha. Rod chucking device for a perforator for perforating a pig iron discharge opening in a blast furnace. 4,682,780, Cl. 279-79.000.

Kuriyama, Hiroaki: *See*—
Ueda, Kouzou; Nagumo, Daisuke; Shuto, Hirotetsu; and Kuriyama, Hiroaki, 4,682,686, Cl. 198-844.000.

Kuroda, Masao: *See*—
Yamamoto, Etsuji; Kohno, Hideki; Kuroda, Masao; Matsui, Shigeru; and Shiono, Hidemi, 4,683,433, Cl. 324-309.000.

Kurome, Yoshio: *See*—
Urata, Keiji; and Kurome, Yoshio, 4,683,264, Cl. 525-65.000.

Kurosaki Refractories Co., Ltd.: *See*—
Hamaguchi, Setsunori; and Hanaoka, Sumio, 4,683,151, Cl. 427-397.800.

Kurosaki, Tadamasa: *See*—
Nakatani, Keiichi; Ohnishi, Shohzo; and Kurosaki, Tadamasa, 4,683,249, Cl. 521-129.000.

Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for ordering a working operation in an assembly line. 4,683,540, Cl. 364-468.000.

Kuschall, Rainer, to Paratec AG. Wheel chair. 4,682,783, Cl. 280-242.0WC.

Kussel, Willy; and Bohle, Werner, to Gewerkschaft Eisenhutte Westfalia. Gearing units for use with mining equipment. 4,682,678, Cl. 192-56.00F.

Kutsumura, Shoji; and Isonaga, Touichi, to Nippon Steel Corp.; and Fujicar Manu. Co. Ltd. Hot coke receiving device. 4,683,031, Cl. 202-227.000.

Kuwabara, Akira, to Dainippon Screen Mfg. Co., Ltd. Method for generating a pixel synchronizing signal in a picture input scanning apparatus and a reproduction record scanning apparatus and apparatus therefor. 4,683,499, Cl. 358-264.000.

Kyocera Kabushiki Kaisha: *See*—
Ueno, Masato, 4,682,644, Cl. 164-359.000.

Kyokuto Kaihatsu Kogyo Co., Ltd.: *See*—
Ueda, Kouzou; Nagumo, Daisuke; Shuto, Hirotetsu; and Kuriyama, Hiroaki, 4,682,686, Cl. 198-844.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,683,205, Cl. 435-172.300.
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.

Kyowa Medex Co., Ltd.: *See*—
Aoyama, Norihito; Miike, Akira; Okano, Mikio; and Tatano, Toshio, 4,683,208, Cl. 436-12.000.

Kysor Industrial Corporation: *See*—
Elmer, Arthur E. H., 4,682,679, Cl. 192-58.00C.

L B & M Associates, Inc.: *See*—
Doerfel, Stephen; Pokorny, Anthony G.; and Rubin, Howard H., 4,682,953, Cl. 434-16.000.

L. & C. Steinmuller GmbH: *See*—
Grethe, Klaus; and Steven, Hubert, 4,682,991, Cl. 55-84.000.

La Telemecanique Electrique: *See*—
Fauvet, Jean-Pierre; and Parisel, Jacques, 4,683,545, Cl. 364-565.000.

Laguzza, Bennett C.; Nichols, Cynthia L.; and Bach, Nicholas J., to Eli Lilly and Company. 2-alkyl(or phenyl)thio-6-N alkyl ergolines and 4-dialkylaminotetrahydrobenz[c,d]indoles. 4,683,313, Cl. 548-437.000.

Laing, Birger: *See*—
Laing, Karsten; Laing, Doerte; and Laing, Birger, 4,682,581, Cl. 126-362.000.

Laing, Doerte: *See*—
Laing, Karsten; Laing, Doerte; and Laing, Birger, 4,682,581, Cl. 126-362.000.

Laing, Karsten; Laing, Doerte; and Laing, Birger. Secondary circulation system. 4,682,581, Cl. 126-362.000.

Lake, Ralph J., Jr.; Stern, Timothy R.; Sudol, George A.; and Selepouchin, Vladimir, to Burroughs Corporation. Data display terminal using a flat display panel. 4,683,465, Cl. 340-700.000.

Lampton, Robert D., Jr.; and Hopkins, Thomas M., II, to Dow Chemical Company, The. Process for the removal of H_2S from geothermal steam and the conversion to sulfur using ferric chelate and cationic polymer. 4,683,076, Cl. 252-191.000.

Lancerotto, Fabio: *See*—
Meroni, Roberto; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,682,466, Cl. 57-274.000.

Landolt, George R.: *See*—
Degnan, Thomas F., Jr.; and Landolt, George R., 4,683,052, Cl. 208-111.000.

Landstingens Inkopscentral Lic, Ekonomisk Forening: *See*—
Feldt, Mats, 4,682,376, Cl. 5-60.000.

Lane, Gary S.: *See*—
Brown, James R.; Lane, Gary S.; and Larson, Wallace H., 4,682,530, Cl. 89-1.550.

Laner, Kai: *See*—
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.

Langenwalter, Michael; Moehrmann, Karl H.; Prussas, Herbert; and Spaeter, Lothar, to Siemens Aktiengesellschaft. Common housing for two semi-conductor bodies. 4,683,489, Cl. 357-81.000.

Langer, Heimo J.: *See*—
Dunnavant, William R.; Fechter, Robert B.; Gardikes, John J.; and Langer, Heimo J., 4,683,252, Cl. 523-143.000.

Langner, Guenther O.: *See*—
Harte, Kenneth J.; and Langner, Guenther O., 4,683,366, Cl. 219-121.0ER.

Langpape, Reinhart; Dornscheidt, Wolfgang; Roze, Jean-Philippe; and Steinleitner, Gunther, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,683,179, Cl. 429-104.000.

Langston, Herbert: *See*—
Mitchell, William; and Langston, Herbert, 4,682,776, Cl. 273-189.00A.

Lankford, Frank L., Jr.: *See*—
Lin, Chew-Chen; Brown, Winthrop K.; Lankford, Frank L., Jr.; Greenhill, Katherine L.; and Campsey, Ronald L., 4,683,464, Cl. 340-685.000.

Lant, Danny: *See*—
Meroni, Roberto; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,682,466, Cl. 57-274.000.

Lantz, Andre : *See*—
Bertaina, Brigitte; Cambon, Aime ; and Lantz, Andre , 4,683,339, Cl. 568-41.000.

Larad Equipment Corporation: *See*—
Bernstein, Robert E.; and Nelson, Alan E., 4,682,755, Cl. 251-4.000.

Larson, Wallace H.: *See*—
Brown, James R.; Lane, Gary S.; and Larson, Wallace H., 4,682,530, Cl. 89-1.550.

Laser Magnetic Storage International Company: *See*—
Grassens, Leonardus J.; and Janssen, Peter J., 4,683,520, Cl. 361-427.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,683,243, Cl. 514-557.000.

Last, Hartmut: *See*—
Bader, Rolf; Last, Hartmut; Mayer, Manfred; Rittner, Siegbert; and Wetzel, Edgar, 4,683,034, Cl. 203-43.000.

LaValley Industrial Plastics, Inc.: *See*—
LaValley, Richard W., 4,683,059, Cl. 210-404.000.

LaValley, Richard W., to LaValley Industrial Plastics, Inc. Vacuum breaker valve-discharge elbow assembly for rotary drum filters. 4,683,059, Cl. 210-404.000.

Leacock, James R.: *See*—
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Markisello, Frank. Method for removing ford ignition pin type cylinders. 4,682,398, Cl. 29-426.400.
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Mehl, Wolfgang, to Sicpa Holding S.A. Transfer sheet for the thermal dry impression of cellulose fibers. 4,682,983, Cl. 08-468.000.
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Morellini, Peter. Gripping apparatus. 4,682,716, Cl. 222-529.000.
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Nippon Telegraph and Telphone Corporation: *See—*
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Odetics, Inc.: *See—*
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O'Donnell & Associates, Inc.: *See—*
Porowski, Jan S.; O'Donnell, William J.; Badlani, Manu L.; and Hampton, Edward J., 4,683,014, Cl. 148-131.000.

O'Donnell, William J.: *See*—
Porowski, Jan S.; O'Donnell, William J.; Badlani, Manu L.; and Hampton, Edward J., 4,683,014, Cl. 148-131.000.
Oehler, Siegfried: *See*—
Kressirer, Rudolf; and Oehler, Siegfried, 4,683,410, Cl. 318-696.000.
Oehr, Klaus H., to B.C. Research Council. Process for preparing ceric sulphate. 4,683,038, Cl. 204-93.000.
Ofusa, Masaatsu; and Ishihama, Toshio, to Yoshida Kogyo K. K. Method and apparatus for manufacturing woven slide fastener stringer. 4,682,635, Cl. 139-116.000.
Ogata, Muneyuki: *See*—
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.
Ogawa, Hiroshi: *See*—
Iida, Koujirou; Yoshioka, Yasuo; Ogawa, Hiroshi; Haruno, Kiyoshi; and Ohigashi, Tsugio, 4,682,768, Cl. 271-3.100.
Ogawa, Hiroyasu: *See*—
Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cyuichi; and Ogawa, Hiroyasu, 4,682,681, Cl. 198-333.000.
Ogawa, Tetsuya: *See*—
Sugimori, Shigeru; Goto, Yasuyuki; and Ogawa, Tetsuya, 4,683,078, Cl. 252-299.610.
Ogawa, Yasuaki: *See*—
Tanaka, Motoaki; Ogawa, Yasuaki; Miyagawa, Tsutomu; and Watanabe, Toshio, 4,683,288, Cl. 528-361.000.
Ohashi, Hisao: *See*—
Hata, Katsuhiko; Ohashi, Hisao; Honda, Keiji; and Yamakami, Takahiko, 4,682,962, Cl. 445-5.000.
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, to Sharp Kabushiki Kaisha. Doped amorphous silicon photoconductive device having a protective coating. 4,683,186, Cl. 430-84.000.
Ohga, Akihiro: *See*—
Hishinuma, Kazuhiro; and Ohga, Akihiro, 4,683,377, Cl. 250-327.200.
Ohga, Juro: *See*—
Miyoshi, Masato; Kaneda, Yutaka; and Ohga, Juro, 4,683,590, Cl. 381-71.000.
Ohigashi, Tsugio: *See*—
Iida, Koujirou; Yoshioka, Yasuo; Ogawa, Hiroshi; Haruno, Kiyoshi; and Ohigashi, Tsugio, 4,682,768, Cl. 271-3.100.
Ohio State University Research Foundation, The: *See*—
Witiak, Donald T.; and Glaser, Ronald M., 4,683,087, Cl. 260-396.00R.
Ohki, Junichi: *See*—
Furukawa, Akihiro; and Ohki, Junichi, 4,683,494, Cl. 358-136.000.
Ohkubo, Masaharu: *See*—
Ohtsuka, Yasumasa; and Ohkubo, Masaharu, 4,682,876, Cl. 355-3.00R.
Ohmae, Masanori: *See*—
Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, 4,683,540, Cl. 364-468.000.
Ohmura, Hiroshi; Tsunekawa, Tokuichi; Kiyohara, Shyuichi; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Photometric device for camera. 4,682,873, Cl. 354-478.000.
Ohnishi, Hiroshi: *See*—
Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, 4,683,193, Cl. 430-570.000.
Ohnishi, Shohzo: *See*—
Nakatani, Keiichi; Ohnishi, Shohzo; and Kurosaki, Tadamasa, 4,683,249, Cl. 521-129.000.
Ohsaka, Yohnosuke; Amimoto, Yoshio; and Negishi, Yoshio, to Daikin Industries Ltd. Novel fluorine-containing polyaminoamide and preparation thereof from fluorooxetane and polyamine. 4,683,289, Cl. 528-402.000.
Ohsaki, Ryouhei: *See*—
Yoshimura, Masato; and Ohsaki, Ryouhei, 4,682,904, Cl. 400-616.000.
Ohshima, Iwao: *See*—
Orii, Koichi; Nishida, Masashi; Yagi, Junsuke; and Ohshima, Iwao, 4,683,128, Cl. 423-338.000.
Ohshima, Ken: *See*—
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,683,560, Cl. 369-45.000.
Ohshima, Nobuaki: *See*—
Ebata, Sakae; and Ohshima, Nobuaki, 4,682,754, Cl. 248-639.000.
Ohta, Masakatsu, to Canon Kabushiki Kaisha. Illumination apparatus. 4,683,524, Cl. 362-268.000.
Ohta, Tokuya: *See*—
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.
Ohtsuka, Yasumasa; and Ohkubo, Masaharu, to Canon Kabushiki Kaisha. Information recording apparatus. 4,682,876, Cl. 355-3.00R.
Oka, Takao: *See*—
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.
Oka, Tetsuo: *See*—
Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,683,205, Cl. 435-172.300.
Okabe, Kazuo: *See*—
Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, 4,683,093, Cl. 264-22.000.
Okabe, Masao: *See*—
Sugio, Akitoshi; Okabe, Masao; and Amagai, Akikazu, 4,683,255, Cl. 524-151.000.
Okachi, Ryo: *See*—
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
Okada, Mitsuhiko; and Ito, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Hydraulic fluid pressure control device for a continuously variable automobile transmission providing a quick speed change ratio increase. 4,682,519, Cl. 74-868.000.
Okada, Shinjiro: *See*—
Kanbe, Junichiro; Okada, Shinjiro; Takahashi, Tohru; and Ando, Yujiro, 4,682,858, Cl. 350-334.000.
Okada, Yasuyuki: *See*—
Kambayashi, Hiroaki; and Okada, Yasuyuki, 4,683,552, Cl. 364-900.000.
Okamura, Kikuko: *See*—
Suzuki, Nobuo; Okamura, Kikuko; Sugiyama, Genpei; and Suzuka, Susumu, 4,683,188, Cl. 430-110.000.
Okano, Mikio: *See*—
Aoyama, Norihito; Miike, Akira; Okano, Mikio; and Tatano, Toshio, 4,683,208, Cl. 436-12.000.
Okashiro, Tetuo: *See*—
Suzuki, Ryozo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetuo, 4,682,936, Cl. 417-366.000.
Okazaki, Hiroshi: *See*—
Kazaoka, Kenichi; Okazaki, Hiroshi; and Inaba, Yasuhisa, 4,682,763, Cl. 267-89.000.
Okazaki, Yukio, to Kabushiki Kaisha Toshiba. Microwave tube output section. 4,683,401, Cl. 315-39.000.
Oki Electric Industry Co., Ltd.: *See*—
Yoshimura, Masato; and Ohsaki, Ryouhei, 4,682,904, Cl. 400-616.000.
Okkerse, Cornelis E. G. Trousers-press. 4,682,429, Cl. 38-36.000.
Okubo, Kiyokazu, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular transmission with additional low speed. 4,682,516, Cl. 74-701.000.
Okuhara, Hisakazu: *See*—
Higuchi, Kazuo; Sugama, Takayuki; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,682,789, Cl. 280-801.000.
Oleck, Stephen M.: *See*—
Angevine, Philip J.; and Oleck, Stephen M., 4,683,214, Cl. 502-66.000.
Olin Corporation: *See*—
Butt, Sheldon H., 4,682,414, Cl. 29-840.000.
Kindlmann, Peter J.; and Lewis, Brian G., 4,682,645, Cl. 164-453.000.
Olschewski, Armin, to SKF GmbH, Schweinfurt. Cover plate for universal joint assembly. 4,682,972, Cl. 464-130.000.
Olsson, Mark S.; Hagey, William H.; and Rosenthal, Brock J. Deep submersible light assembly. 4,683,523, Cl. 362-267.000.
Olszewski, William V.: *See*—
LeGrand, Donald G.; and Olszewski, William V., 4,683,172, Cl. 428-412.000.
Olympus Optical Co., Ltd.: *See*—
Konomura, Yutaka, 4,682,599, Cl. 128-328.000.
Matsuo, Kazumasa, 4,682,586, Cl. 128-6.000.
Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, 4,683,560, Cl. 369-45.000.
Togino, Takayosi; Kobayashi, Yuki; and Yonekubo, Ken, 4,682,859, Cl. 350-414.000.
Yusa, Atsushi, 4,683,125, Cl. 423-219.000.
Omoto, Setsuo: *See*—
Onizuka, Masakazu; Tatani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, 4,683,210, Cl. 436-50.000.
Omron Tateisi Electronics Co.: *See*—
Matsumoto, Hiromichi, 4,683,372, Cl. 235-492.000.
Onizuka, Masakazu; Tatani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for measuring concentrations of $CaCO_3$ and $CaSO_3$ in a slurry. 4,683,210, Cl. 436-50.000.
Onizuka, Masakazu; Tatani, Atsushi; and Hamada, Takayoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for measuring the concentration of $CaCO_3$ in a slurry. 4,683,211, Cl. 436-50.000.
Ono, Katsuhiro, to NGK Insulators, Ltd. Ceramic center for machine tools. 4,682,445, Cl. 51-236.000.
Ono, Kyushichi, to Asahi Breweries Ltd. Method and apparatus for preventing clogging of powdery granules in liquid powdery granule treating system. 4,682,737, Cl. 241-34.000.
Ono, Yoichi, to Seiko Epson Kabushiki Kaisha. Method of manufacturing MIM elements in liquid crystal displays. 4,683,183, Cl. 430-20.000.
Onoda, Hiroshi; and Mizuno, Kenji, to Brother Kogyo Kabushiki Kaisha. Writing plotting apparatus with keyboard. 4,682,902, Cl. 400-18.000.
Ooguro, Yukito, to Sanyo Mikawa Body Corp. Van body used with container car, freight car and truck. 4,682,811, Cl. 296-181.000.
Opfer, John C., to S&C Electric Company. Switch-operating mechanism with improved charging arrangement. 4,683,357, Cl. 200-153.0SC.
Opitz, Hans-Georg: *See*—
Stadler, Peter; Lockhoff, Oswald; Opitz, Hans-Georg; and Schaller, Klaus, 4,683,222, Cl. 514-42.000.
Orban, Ivan; and Fussenegger, Werner, to Ciba-Geigy Corporation. Solvent-free crystallization of pentaerythritol tetrakis-[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] and the novel alpha-crystalline form thereof. 4,683,326, Cl. 560-75.000.
Oren, Zohar, to Makhteshim Chemical Works Ltd. Process for the production of methomyl oxime. 4,683,322, Cl. 558-3.000.

Orii, Koichi; Nishida, Masashi; Yagi, Junsuke; and Ohshima, Iwao, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Process for manufacturing high purity silica. 4,683,128, Cl. 423-338.000.

Orillo, Stephen, Jr.: *See—*
Wilger, John F.; Orillo, Stephen, Jr.; and Nakano, Gregory S., 4,682,631, Cl. 138-94.000.

Orion-Yhtyma: *See—*
Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.

Orlandi, Daniel A.: *See—*
Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A., 4,683,138, Cl. 426-5.000.

Orner, Angelika: *See—*
Rauer, Kurt; and Orner, Angelika, 4,683,248, Cl. 521-96.000.

Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, to Minolta Camera Kabushiki Kaisha. Electrophotosensitive member having alternating amorphous semiconductor layers. 4,683,184, Cl. 430-57.000.

Osawa, Izumi; Doi, Isao; and Natsuhara, Toshiya, to Minolta Camera Kabushiki Kaisha. Electrophotosensitive member having a depletion layer. 4,683,185, Cl. 430-57.000.

Osborn, Paul V., to Mobil Oil Corporation. Lightweight tarpaulin. 4,682,447, Cl. 52-3.000.

Oshima, Ryoichi: *See—*
Yanami, Tetsuji; Murai, Yoshiyuji; and Oshima, Ryoichi, 4,683,297, Cl. 536-18.600.

Ota, Yoshifumi: *See—*
Nakamura, Kyuzo; Ota, Yoshifumi; and Asaka, Tsutomu, 4,683,176, Cl. 428-692.000.

Otis Engineering Corporation: *See—*
Waters, Fleming A., 4,682,656, Cl. 166-372.000.

Ott, Karl-Heinz: *See—*
Kress, Hans-Jurgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, 4,683,265, Cl. 525-67.000.

Ottosensor Corporation: *See—*
Prohaska, Otto, 4,682,602, Cl. 128-635.000.

Ouchi, Takahiro: *See—*
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

Oudejans, Johannes C.; Nootenboom, Peter; Ganguli, Keshab L.; and Lok, Cornelis M., to Internationale Octrooi Maatschappij "Octropa" BV. Nickel/alumina/silicate catalyst, its preparation and use. 4,683,088, Cl. 260-409.000.

Oudenhoven, Martin S.; and Ruskey, Frank. Method and apparatus for controlling the temperature and flow rate of a fluid. 4,682,728, Cl. 236-12.120.

Outboard Marine Corporation: *See—*
Hall, Charles B.; and Mondek, Martin J., 4,682,759, Cl. 251-210.000.
Lieb, M. Jeremy; and Collis, Raymond D., 4,682,560, Cl. 114-343.000.

Owens-Corning Fiberglas Corporation: *See—*
Brannon, Robert C.; Sage, Donald B., Jr.; and Miller, David G., 4,683,254, Cl. 523-503.000.
Johnson, Alan R.; and Yawberg, Richard C., 4,682,523, Cl. 83-19.000.

Oyler, John F.; Brand, Jerry D.; and Zavada, Richard, to Dravo Corporation. Circular solvent extractor. 4,683,029, Cl. 196-14.520.

Ozaki, Akio: *See—*
Katsumata, Ryoichi; Ozaki, Akio; Oka, Tetsuo; and Furuya, Akira, 4,683,205, Cl. 435-172.300.

Ozawa, Masaaki: *See—*
Nakano, Sota; and Ozawa, Masaaki, 4,683,003, Cl. 106-86.000.

Ozawa, Michihiro: *See—*
Mochida, Takaaki; Yamashita, Junichi; Yoshioka, Toshiro; and Ozawa, Michihiro, 4,683,113, Cl. 376-419.000.

Ozima, Kazuhira: *See—*
Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cyuichi; and Ogawa, Hiroyasu, 4,682,681, Cl. 198-333.000.

P & H Enterprises Limited (Musical Products): *See—*
Hubbie, Terence H., 4,682,451, Cl. 52-97.000.

Paar, Willibald; and Honig, Helmut, to Vianova Kunstharz, A.G. Pigment grinding vehicles for use in water-dilutable paints. 4,683,285, Cl. 528-113.000.

Pace, Incorporated: *See—*
Barkley, Vincent, 4,682,766, Cl. 269-71.000.

Page, Littleton D.: *See—*
Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., 4,683,550, Cl. 364-900.000.

Pagliaro, Michael J. Peg drops. 4,682,527, Cl. 84-305.000.

Palau, Joseph; and Bassi, Dario. Lifting beam for shed forming device in a weaving loom. 4,682,634, Cl. 139-85.000.

Palermo, Anthony C.; Christenson, Roger M.; and Mazza, Glenn L., to Ashland Oil, Inc. Compositions thickened through urethane reaction. 4,683,266, Cl. 525-123.000.

Palinczar, Victor. Waterproof sunscreen compositions. 4,683,134, Cl. 424-59.000.

Palladino, Michael, to Sloan-Kettering Institute for Cancer Research. Interleukin-2 dependent cytotoxic T-cell clones. 4,683,199, Cl. 435-68.000.

Palm, Bernhard, to Milwaukee Electric Tool Corporation. Keyless impacting chuck. 4,682,918, Cl. 408-241.00R.

Palmer, William B.; and Fink, Henry, to TRW Inc. Releasable coupling assembly. 4,682,804, Cl. 294-82.260.

Paper Converting Machine Company: *See—*
Buxton, Gerald W., 4,682,977, Cl. 493-358.000.

Paradyne Corporation: *See—*
Betts, William L.; and Zuranski, Edward S., 4,683,578, Cl. 375-98.000.

Paratec AG: *See—*
Kuschall, Rainer, 4,682,783, Cl. 280-242.0WC.

Parisel, Jacques: *See—*
Fauvet, Jean-Pierre; and Parisel, Jacques, 4,683,545, Cl. 364-565.000.

Parli, C. John: *See—*
Whitten, Kathleen R.; Garbrecht, William L.; Marzoni, Gifford P.; and Parli, C. John, 4,683,236, Cl. 514-288.000.

Parrish, Stanley G. Buckle and body restraint system for a vehicle. 4,682,390, Cl. 24-632.000.

Parrow, R. Alan; and DiAntonio, Francis W. Fuel line adaptor. 4,682,796, Cl. 285-39.000.

Parsons, Natan. Cervical-dilation meter. 4,682,609, Cl. 128-775.000.

Patil, Shashikant M.: *See—*
Jindrick, James A.; Patil, Shashikant M.; Morrison, Margaret S.; and Page, Littleton D., 4,683,550, Cl. 364-900.000.

Pattany, Pradip M.; and Nayler, Graham L., to Picker International, Inc. Magnetic resonance imaging of high velocity flows. 4,683,431, Cl. 324-306.000.

Pawlek, Rudolf: *See—*
Scharpey, Wilhelm; and Pawlek, Rudolf, 4,683,046, Cl. 204-243.00R.

Pawling, Daniel F.: *See—*
Martin, Andrew McG.; Meyers,-Kenneth C.; and Pawling, Daniel F., 4,682,976, Cl. 493-206.000.

Payre, Didier; Crozat, Georges; and Spinner, Bernard, to Societe Nationale Elf Aquitaine. Three-phase heat pump. 4,682,476, Cl. 62-480.000.

Pearce, Phillip W.: *See—*
Shipkowski, James P.; and Pearce, Phillip W., 4,683,380, Cl. 250-548.000.

Pecht, Israel; and Mazurek, Nachman, to Yeda Research and Development Co., Ltd. DSCG binding protein and process for preparing same. 4,683,135, Cl. 424-85.000.

Pelava, John W.: *See—*
Wilson, David P.; Pham, Hang T.; Lund, Earl A. E.; Basu, Rajat S.; and Pelava, John W., 4,683,075, Cl. 252-171.000.

Peletan, Rene : *See—*
Martin, Jean; and Peletan, Rene , 4,683,102, Cl. 376-209.000.

Peng, Chen H. Refuse disposing method and the apparatus thereof. 4,682,548, Cl. 110-222.000.

Pennwalt Corporation: *See—*
Clark, Roger T., 4,683,090, Cl. 260-543.00R.
Georgiev, Vassil S.; and Mullen, George B., 4,683,311, Cl. 548-240.000.

Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, to Clairol Incorporated. Dual compartment container. 4,682,689, Cl. 206-222.000.

Perkin-Elmer Corporation, The: *See—*
Reynolds, Robert W., 4,682,805, Cl. 294-86.400.

Perkins, Clarence: *See—*
Henslin, Frederick L.; and Perkins, Clarence, 4,682,417, Cl. 30-294.000.

Pernick, Bruce M. Seamless knit composite garment blank and method. 4,682,479, Cl. 66-176.000.

Peste, Hansgeorg: *See—*
Bauerle, Hans; Peste, Hansgeorg; and Pohlner, Erwin, 4,682,489, Cl. 72-460.000.

Peters, Horst: *See—*
Kress, Hans-Jurgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, 4,683,265, Cl. 525-67.000.

Peters, Rudolf: *See—*
Upmeier, Hartmut; and Peters, Rudolf, 4,682,941, Cl. 425-72.00R.

Petersen, W. Christian, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,683,000, Cl. 71-92.000.

Petersen, Walter J.; and Svendsen, John M., to Wagner Spray Tech Corporation. Hot air gun with air directing housing. 4,683,370, Cl. 219-370.000.

Peterson, Carlton G. Power train for heavy lift helicopters. 4,682,512, Cl. 74-410.000.

Peterson, Charlie A.: *See—*
Burkman, Don C.; Schumacher, David D.; and Peterson, Charlie A., 4,682,615, Cl. 134-102.000.

Peterson, Donald A., Jr.: *See—*
Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson, Donald A., Jr., 4,683,532, Cl. 364-200.000.

Peterson, Lars-Eric; and Soderlind, Jan. Protective apron. 4,682,372, Cl. 2-51.000.

Peterson, Michael: *See—*
Handler, Milton E.; Sylvan, Richard; and Peterson, Michael, 4,682,698, Cl. 211-70.600.

Peterson, Robert T.: *See—*
Klee, Maurice; Peterson, Robert T.; Cochran, Gary L.; Dawson, James E.; and Anderson, Robert M., 4,682,666, Cl. 180-89.130.

Petro Canada Inc.: *See—*
Poirier, Marc-Andne , 4,683,005, Cl. 106-273.00R.

Petro, John D., to Commercial Shearing, Inc. Gear pump or motor with tooth tips of dissimilar metal. 4,682,939, Cl. 418-178.000.

Petrovich, Alexandr E.: *See*—
Bezborodov, Vladimir S.; Konovalov, Viktor A.; Ptashnikov, Jury L.; Astafiev, Vladimir M.; and Petrovich, Alexandr E., 4,683,079, Cl. 252-299.670.

Peyre, Henri, to Ste Look, French Societe Anonyme. Safety ski binding. 4,682,786, Cl. 280-628.000.

Pfaendler, Hans R. Reduction process for the preparation of 4-unsubstituted azetidin-2-ones. 4,683,303, Cl. 540-362.000.

Pfeffer, George B., to ADC Telecommunications, Inc. Insertion tool. 4,682,412, Cl. 29-750.000.

Pfeiffer, Francis R.: *See*—
Demarinis, Robert M.; and Pfeiffer, Francis R., 4,683,229, Cl. 514-213.000.

Pfeiler, Manfred: *See*—
Haas, Werner; Knuepfer, Wolfgang; and Pfeiler, Manfred, 4,682,600, Cl. 128-328.000.

Pfister GmbH: *See*—
Hafner, Hans W., 4,682,915, Cl. 406-31.000.

Pham, Hang T.: *See*—
Wilson, David P.; Pham, Hang T.; Lund, Earl A. E.; Basu, Rajat S.; and Pelava, John W., 4,683,075, Cl. 252-171.000.

Phillips Petroleum Company: *See*—
Bennett, Richard J., 4,683,290, Cl. 528-480.000.
Cobb, Raymond L., 4,683,033, Cl. 203-38.000.
Craig, William S., 4,683,293, Cl. 530-359.000.

Phillips, Samuel J., to Litton Systems, Inc. Apparatus for supporting and aligning equipment. 4,683,354, Cl. 200-61.410.

Photon Devices, Ltd.: *See*—
Margolin, George D., 4,682,794, Cl. 283-82.000.

Piaget, Claude: *See*—
Jarry, Philippe; Haji, Mohamed L.; Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,683,163, Cl. 428-209.000.

Pickard, Murphy L. Apparatus and method for testing prosthetic heart valves. 4,682,491, Cl. 73-37.000.

Picker International, Inc.: *See*—
Pattany, Pradip M.; and Nayler, Graham L., 4,683,431, Cl. 324-306.000.
Young, Ian R., 4,683,432, Cl. 324-309.000.

Pidgeon, Alastair N.; and Webb, Arthur L., to Marconi Company Limited, The. Solar cell arrays. 4,683,348, Cl. 136-246.000.

Pietro Dondi & Figli S.r.l.: *See*—
Dondi, Giuliano, 4,682,427, Cl. 37-91.000.

Piezo Electric Products, Inc.: *See*—
Rice, Roy W.; Kahn, Manfred; and Shadwell, Damian E., 4,683,161, Cl. 428-178.000.

Pilet, Jean-Claude: *See*—
De Burgat, Michel; Le Traon, Andre ; Pilet, Jean-Claude; and Sharaiha, Ammar, 4,683,417, Cl. 324-60.00C.

Pinkham, Raymond, to Texas Instruments Incorporated. Serial accessed semiconductor memory with reconfigureable shift registers. 4,683,555, Cl. 365-215.000.

Pinto, Akiva, to John D. Hollingsworth on Wheels, Inc. Textile flock feed control system and method. 4,682,388, Cl. 19-105.000.

Pion, Jacques: *See*—
Bachmann, Jean-Marie; Pion, Jacques; and Raisin, Jean-Pierre, 4,682,553, Cl. 112-121.120.

Pioneer Electronic Corporation: *See*—
Higashi, Ryoji; and Nomura, Satoru, 4,683,502, Cl. 358-342.000.
Kato, Shigeru, 4,683,449, Cl. 333-14.000.
Matsui, Fumio; and Murata, Yasushi, 4,683,562, Cl. 369-284.000.

Piper, Douglas E.; and Black, Michael D., to 501 Woven Electronics Corporation. Bus bar bridged pc board for transitional termination of multiple cables and method. 4,682,828, Cl. 439-92.000.

Pirelli Coordinamento Pneumatici S.p.A.: *See*—
Pizzorno, Augusto, 4,682,940, Cl. 425-34.00R.

Pischzik, Bruno, to Mannesmann Aktiengesellschaft. Holding fixture for a pipe-line. 4,682,752, Cl. 248-550.000.

Pitkajarvi, Kari, to Valmet Oy. Method and apparatus in a paper machine for regulating pressure in the space between a headbox lip beam and breast roll. 4,683,027, Cl. 162-199.000.

Pitney Bowes Inc.: *See*—
Pollak, Philip, Jr.; and Schubert, Keith E., 4,682,541, Cl. 101-91.000.

Pittet, Alan O.; Muralidhara, Ranya; and Liberman, Arthur L., to International Flavors & Fragrances Inc. Process for preparing natural benzaldehyde and acetaldehyde, natural benzaldehyde and acetaldehyde compositions, products produced thereby and organoleptic utilities therefor. 4,683,342, Cl. 568-464.000.

Pittsburgh Tube Company: *See*—
Blaho, Lester J., 4,682,921, Cl. 409-299.000.

Pivot Manufacturing Company: *See*—
Ernst, M. Eric; and Jewett, Walter L., 4,682,719, Cl. 224-310.000.

Pizzorno, Augusto, to Pirelli Coordinamento Pneumatici S.p.A. Double-molded vulcanizing press. 4,682,940, Cl. 425-34.00R.

Placek, Ronald J.: *See*—
Knorowski, Victor J.; Hean, Charles R.; and Placek, Ronald J., 4,682,934, Cl. 416-198.00A.

Plasti-Line, Inc.: *See*—
Ramsay, Charles F., 4,682,430, Cl. 40-5.000.

Plessey Incorporated: *See*—
Barba, Valentin G.; and Shube, Eugene E., 4,683,407, Cl. 318-689.000.

Plummer, James D.: *See*—
Blanchard, Richard A.; and Plummer, James D., 4,682,405, Cl. 29-571.000.

Pneumedic Corp.: *See*—
Curlee, James D., 4,682,587, Cl. 128-78.000.
Curlee, James D., 4,682,588, Cl. 128-78.000.

Pneupac Limited: *See*—
Jones, Norman S., 4,682,591, Cl. 128-204.250.

Poggi, Tatjana: *See*—
Krakkay, Tibor; Poggi, Tatjana; and Schubert, Ernst, 4,683,286, Cl. 525-329.100.

Pohlner, Erwin: *See*—
Bauerle, Hans; Peste, Hansgeorg; and Pohlner, Erwin, 4,682,489, Cl. 72-460.000.

Poirier, Marc-Andne , to Mines and Resources Canada; and Petro Canada Inc. Road asphalt compositions containing hydrocracked pitch. 4,683,005, Cl. 106-273.00R.

Pokorny, Anthony G.: *See*—
Doerfel, Stephen; Pokorny, Anthony G.; and Rubin, Howard H., 4,682,953, Cl. 434-16.000.

Pokorny, L. Robert, to Louis Pokorny Company, Inc. Sofa-bed assembly. 4,682,375, Cl. 5-13.000.

Polaroid Corporation: *See*—
Mansfield, Robert J., 4,682,994, Cl. 65-3.120.

Polaschegg, Hans-Dietrich, to Fresenius AG. Hemodialysis device. 4,683,053, Cl. 210-86.000.

Poleschuk, LeRoy A.: *See*—
Poleschuk, Nicholas A.; and Poleschuk, LeRoy A., 4,683,521, Cl. 362-80.000.

Poleschuk, Nicholas A.; and Poleschuk, LeRoy A., to Beta Manufacturing Corp. Under hood and luggage compartment lamp assembly. 4,683,521, Cl. 362-80.000.

Pollak, Philip, Jr.; and Schubert, Keith E., to Pitney Bowes Inc. Postal mailing system having an adaptable postage meter. 4,682,541, Cl. 101-91.000.

Pollen, Rudy W. J.: *See*—
Baggen, Constant P. M. J.; Driessen, Leonardus M. H. E.; Pollen, Rudy W. J.; and Vries, Lodewijk B., 4,683,572, Cl. 371-37.000.

Pomilia, Gino. Baseball training bat. 4,682,773, Cl. 273-26.00B.

Pool, Jerry S., to Leggett & Platt, Incorporated. Insulated shipping container. 4,682,708, Cl. 220-460.000.

Poole, William E., Jr.: *See*—
Talwar, Ashok K.; Poole, William E., Jr.; and Steinkolk, Richard B., 4,683,447, Cl. 331-177.00V.

Popovic, Radivoje, to LGZ Landis & Gyr Zug AG. Electrical circuit which is linearly responsive to changes in magnetic field intensity. 4,683,429, Cl. 324-225.000.

Porowski, Jan S.; O'Donnell, William J.; Badlani, Manu L.; and Hampton, Edward J., to O'Donnell & Associates, Inc. Mechanical stress improvement process. 4,683,014, Cl. 148-131.000.

Portalupi, Steven J.; and Riggs, Robert S., to Goodyear Tire & Rubber Company, The. Apparatus for storing and feeding tire beads. 4,683,020, Cl. 156-403.000.

Porter, Stuart C.; and Woznicki, Edward J., to Colorcon, Inc. Dry edible film coating composition, method and coating form. 4,683,256, Cl. 524-285.000.

Pose, Wolfgang. Dental care instrument. 4,682,584, Cl. 128-1.300.

Poser, Richard G., to A. H. Robins Company, Incorporated. Transdermal treatment for pain and inflammation with 2-amino-3-aroylbenzeneacetic acids, salts and esters. 4,683,242, Cl. 514-539.000.

Potier, Michel, to Valeo. Heat exchanger of the tube bank type, in particular for an automotive vehicle. 4,682,650, Cl. 165-173.000.

Potocnik, Vinko: *See*—
Boivin, Richard F.; Huni, Jean-Paul R.; and Potocnik, Vinko, 4,683,047, Cl. 204-243.00M.

Potters Industries, Inc.: *See*—
Fuchs, Alfred E., 4,682,992, Cl. 55-279.000.

Power Kinetics, Inc.: *See*—
Rogers, William E.; and Borton, David N., 4,682,865, Cl. 350-607.000.

PPG Industries, Inc.: *See*—
Hodek, Robert B.; and Seiner, Jerome A., 4,683,344, Cl. 568-716.000.

Prahl, Joseph M., to Scott & Fetzer Company, The. Vacuum generating system for hand-held vacuum cleaner. 4,682,384, Cl. 15-344.000.

Pratt & Whitney Canada Inc.: *See*—
Morissette, Pierre; Stewart, Alexander W.; and Taylor, Keith H., 4,682,505, Cl. 73-862.340.

Praus, Gerd: *See*—
Holdt, Bernd-Dieter; Menke, Ronald; Praus, Gerd; and Hasselbach, Petra, 4,683,072, Cl. 252-102.000.

Precision Monolithics, Inc.: *See*—
Morton, William D., 4,683,423, Cl. 324-158.00F.

Price, Raymond: *See*—
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,683,310, Cl. 546-321.000.

Proconics International, Inc.: *See*—
Foulke, Richard F.; and Lord, Steven M., 4,682,928, Cl. 414-416.000.

Proctor, Rudy R.; and Reinstein, Fred M., to Turbo Tek Enterprises, Inc. Spraying device having controlled additive fluid feed and a telescoping spray tube assembly. 4,682,734, Cl. 239-315.000.

Prohaska, Otto, to Ottosensor Corporation. Probe for medical application. 4,682,602, Cl. 128-635.000.

Propp, Clarence E.; and Kerr, J. Russell. Hanger assembly. 4,682,452, Cl. 52-118.000.

Proto-Power Corporation: *See*—
Baudro, Thomas O.; and Leonard, John S., 4,683,110, Cl. 376-261.000.

Heim, John L.; and Leonard, John S., 4,683,111, Cl. 376-391.000.

Provenda Marketing AG: *See*—
Hansen, Eckard, 4,682,814, Cl. 297-300.000.

Prugh, John D., to Merck & Co., Inc. 3-O-benzyl-2,4,6-trideoxy-6-iodo-alpha-D-erythro-hexopyrande useful for preparing inhibitors of 3-hydroxy-3-methylglutaryl coenzyme a reductase. 4,683,314, Cl. 549-417.000.

Prussas, Herbert: *See*—
Langenwalter, Michael; Moehrmann, Karl H.; Prussas, Herbert; and Spaeter, Lothar, 4,683,489, Cl. 357-81.000.

Ptashnikov, Jury L.: *See*—
Bezborodov, Vladimir S.; Konovalov, Viktor A.; Ptashnikov, Jury L.; Astafiev, Vladimir M.; and Petrovich, Alexandr E., 4,683,079, Cl. 252-299.670.

Punako, Stephen; Gallusser, David O.; and Williams, Warren R., Jr., to Allied Corporation. Retaining an insert in an electrical connector. 4,682,832, Cl. 439-589.000.

Quan, Peter M.: *See*—
Dalton, Raymond F.; Price, Raymond; Quan, Peter M.; and Stewart, David, 4,683,310, Cl. 546-321.000.

Quatse, Jesse T., to Telemecanique Electrique. Serial information transfer protocol. 4,683,530, Cl. 364-200.000.

Quinlan, Thomas J., III: *See*—
Young, Gladstone F.; Green, Richard F.; Miller, S. David; and Quinlan, Thomas J., III, 4,683,564, Cl. 370-63.000.

R. Alkan & Cie: *See*—
Duclos, Didier A.; and Coutin, Pierre F., 4,682,529, Cl. 89-1.510.

R. E. Phelon Company, Inc.: *See*—
Gwozdz, Adam A., 4,683,518, Cl. 361-263.000.

R. W. Hartnett Company: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,682,683, Cl. 198-380.000.

Rabushka, Charles; and Reprogle, Layton J., to Rabushka, Charles. Tension actuated uncoupler. 4,682,795, Cl. 285-1.000.

Radermacher, Herbert: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schwarzenberg, Norbert; Radermacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, 4,682,997, Cl. 65-106.000.

Radford, Kenneth C.: *See*—
Ho, Shih-Ming; and Radford, Kenneth C., 4,683,114, Cl. 376-419.000.

Ragn-Sellsforetagen AB: *See*—
Hall, Lars, 4,682,549, Cl. 110-345.000.

Rairden, John R., III, to General Electric Company. Method of producing high quality plasma spray deposits of complex geometry. 4,683,148, Cl. 427-34.000.

Raisin, Jean-Pierre: *See*—
Bachmann, Jean-Marie; Pion, Jacques; and Raisin, Jean-Pierre, 4,682,553, Cl. 112-121.120.

Ramsay, Charles F., to Plasti-Line, Inc. Price chip support strip. 4,682,430, Cl. 40-5.000.

Randig, George W., to United States of America, Air Force. Survivable ground base sensor. 4,683,474, Cl. 342-368.000.

Randow, Rodney L.: *See*—
Beckley, Ronald S.; Randow, Rodney L.; and Swift, Graham, 4,683,100, Cl. 260-513.00R.

Rao, Velliyur N. M., to Du Pont de Nemours, E. I., and Company. Beneficial use of water in catalytic conversion of formamides to isocyanates. 4,683,329, Cl. 560-338.000.

Rasmussen GmbH: *See*—
Sauer, Heinz, 4,682,798, Cl. 285-174.000.

Rasseneur, Laurent B.: *See*—
De Rigal, Jean P.; Leveque, Jean-Luc; Rasseneur, Laurent B.; and Losch, Marie-Jeanne, 4,682,608, Cl. 128-774.000.

Ratton, Serge, to Rhone-Poulenc Specialites Chimiques. Selective preparation of monohalohydroquinones. 4,683,346, Cl. 568-765.000.

Rauer, Kurt; and Orner, Angelika, to Luperox GmbH. Crosslinking of styrene polymers. 4,683,248, Cl. 521-96.000.

Rausch, Georg: *See*—
Hartwig, Manfred; and Rausch, Georg, 4,682,756, Cl. 251-63.500.

RCA Corporation: *See*—
Gounder, Raj N., 4,682,744, Cl. 244-158.00R.
Strolle, Christopher H.; Smith, Terrence R.; and Hadwen, Brian M., 4,683,490, Cl. 358-30.000.
Topper, Robert J., 4,683,498, Cl. 358-209.000.
Truskalo, Walter; and Nolan, Thomas F., 4,683,405, Cl. 315-371.000.

Readman, John; and Bland, Timothy J., to Sundstrand Corporation. Oil scavenge system. 4,683,389, Cl. 310-62.000.

Redco N.V.: *See*—
Anton, Octavian; Crichton, Robert; and Lenders, Jean-Pierre, 4,683,203, Cl. 435-94.000.

Reed, Bradley O., to General Electric Company. Gear train for four range hydromechanical steering transmission. 4,682,515, Cl. 74-687.000.

Reed Manufacturing Company: *See*—
Mitchell, Joseph T., 4,682,919, Cl. 409-179.000.

Reed Tool Company: *See*—
Daly, Jeffery E.; and Schumacher, Percy W., 4,682,663, Cl. 175-329.000.

Reed, Wilmer H., to United States of America, National Aeronautics & Space Administration. Airfoil flutter model suspension system. 4,682,494, Cl. 73-147.000.

Reeder, Leonard J. Repair kit for detent cables. 4,682,513, Cl. 206-223.000.

Reetz, William R., to Trus Joist Corporation. Open web structural support mounting bracket and length adjustable web member. 4,682,460, Cl. 52-632.000.

Reeves, Richard R. Detachable shoe-lure dispenser. 4,682,715, Cl. 222-175.000.

Regdon Solenoid, Inc.: *See*—
Henley, Lester P., 4,683,452, Cl. 335-234.000.

Regenass, Franz. Benzotriazole mixtures, processes for producing them, and their use as metal passivators. 4,683,071, Cl. 252-49.300.

Rehkopf, Charles H.: *See*—
Daldry, Kenneth J.; Fischman, Martin; and Rehkopf, Charles H., 4,682,963, Cl. 445-5.000.

Rei, Nuno M.; and Wilson, Ronald C., to Morton Thiokol, Inc. Microbiocidal compositions comprising an aryl alkanol and a microbiocidal compound dissolved therein. 4,683,080, Cl. 252-364.000.

Reich, Peter S., to Design Mobility, Inc. Device for transferring immobile persons. 4,682,377, Cl. 5-86.000.

Reichelt, Achim: *See*—
Mahlein, Hans F.; Michel, Herbert; Reichelt, Achim; and Winzer, Gerhard, 4,682,843, Cl. 350-96.150.

Reichhold Chemicals, Inc.: *See*—
Aksman, Igor B., 4,683,269, Cl. 525-258.000.

Reighard, Alan B.; and Soutar, Larry, to Nordson Corporation. Method and apparatus for sealing welded seams of automobiles. 4,682,711, Cl. 222-75.000.

Reinhardt, Bruce A.: *See*—
Lindley, Patricia M.; Reinhardt, Bruce A.; and Arnold, Fred E., 4,683,340, Cl. 568-331.000.
Unroe, Marilyn R.; Reinhardt, Bruce A.; and Arnold, Fred E., 4,683,309, Cl. 544-353.000.

Reinmold, Heinz-Josef: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schwarzenberg, Norbert; Radermacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, 4,682,997, Cl. 65-106.000.

Reinstein, Fred M.: *See*—
Proctor, Rudy R.; and Reinstein, Fred M., 4,682,734, Cl. 239-315.000.

Reiser, Arthur G.: *See*—
Judge, Norman R.; Judge, Edward E., Jr.; and Reiser, Arthur G., 4,682,444, Cl. 51-154.000.

Renaud, Juan E. Celery peeling holder. 4,682,764, Cl. 269-3.000.

Renault, Serge A. M.: *See*—
Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Francoise M. M.; Themont, Jean-Pierre; and Vachet, Andre J., 4,683,153, Cl. 428-1.000.

Rengo Co., Ltd.: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,682,743, Cl. 242-58.600.

Reprogle, Layton J.: *See*—
Rabushka, Charles; and Reprogle, Layton J., 4,682,795, Cl. 285-1.000.

Republic Steel Corporation: *See*—
Harris, Richard M.; and Abramczyk, Richard F., 4,683,430, Cl. 324-241.000.

Research Development Corporation of Japan: *See*—
Hayashi, Chikara; and Kashu, Seiichiro, 4,683,118, Cl. 419-23.000.

Research Foundation for Mental Hygiene, Inc.: *See*—
Glassman, Alexander H., 4,683,231, Cl. 514-220.000.

Ressel, Herbert: *See*—
Kolkmann, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, 4,683,127, Cl. 423-321.00R.

Revere, William G., Jr., to Lockheed Corporation. Anvil insert for fastener machine. 4,682,392, Cl. 29-34.00B.

Rexnord Inc.: *See*—
Leege, James W.; Stacey, Robert E.; and Uttke, Russell H. C., 4,682,687, Cl. 198-852.000.

Rexroat, Gary D.: *See*—
Scott, Lawrence M.; and Rexroat, Gary D., 4,683,167, Cl. 428-328.000.

Reynolds, Robert W., to Perkin-Elmer Corporation, The. Grasping finger position sensor for a robot system. 4,682,805, Cl. 294-86.400.

Rhone-Poulenc Specialites Chimiques: *See*—
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Rice, Roy W.; Kahn, Manfred; and Shadwell, Damian E., to Piezo Electric Products, Inc. Ceramic body with ordered pores. 4,683,161, Cl. 428-178.000.

Rice, Wayne K., to Vitamins, Inc. Method for carrying out extractions in subterranean well. 4,683,063, Cl. 210-634.000.

Richard Jansen GmbH: *See*—
Jansen-Herfeld, Roettger, 4,682,525, Cl. 83-751.000.

Richard Wolf GmbH: *See*—
Hiltebrandt, Siegfried, 4,682,585, Cl. 128-4.000.

Richardson-Vicks, Inc.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,683,243, Cl. 514-557.000.

Ricoh Company, Ltd.: *See*—
Emoto, Masami; Gotoh, Hiroshi; and Inuzuka, Hideo, 4,683,559, Cl. 369-44.000.
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Uezu, Kazuo; Maehara, Hidejirou; and Momose, Masanori, 4,683,478, Cl. 346-76.0PH.

Ricoux, Philippe. *See*—
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Riding, Kenneth; and Adamson, John, to Lucas Industries public limited company. Brake pad retaining plate assemblies for use in brake shoe assemblies. 4,682,905, Cl. 403-327.000.

Rieckman, Roger A.; Hemrich, William R.; Jursich, Donald N.; and Crowley, George C., to John Zink Company. Hand held electric hair dryer. 4,683,369, Cl. 219-364.000.

Rigaud, Philippe: *See*—
Armand, Michel; Chabagno, Jean-Michel; Ricoux, Philippe; Vassort, Guy; Gauthier, Michel; Brochu, Fernand; and Rigaud, Philippe, 4,683,181, Cl. 429-192.000.

Riggs, Robert S.: *See*—
Portalupi, Steven J.; and Riggs, Robert S., 4,683,020, Cl. 156-403.000.

Riley, John A. Method and apparatus for automated polymeric film coating. 4,683,143, Cl. 427-8.000.

Riley, Martin E.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,683,575, Cl. 372-59.000.

Riordan, R. Michael, to Sundstrand Corporation. Gear pump bearings. 4,682,938, Cl. 418-1.000.

Risho Kogyo Co., Ltd.: *See*—
Miyake, Yoshifumi; and Sakka, Sumio, 4,683,253, Cl. 523-442.000.

Ritson, John R. Fold-away blind. 4,682,436, Cl. 43-1.000.

Rittner, Siegbert: *See*—
Bader, Rolf; Last, Hartmut; Mayer, Manfred; Rittner, Siegbert; and Wetzel, Edgar, 4,683,034, Cl. 203-43.000.

Rivas, Olegario, to Intevep, S.A. Slotted housing having multiple seats for supporting and locating submersible pumps in deep wells. 4,682,655, Cl. 166-369.000.

Roberge, Guy: *See*—
Ueda, Yasutsugu; and Roberge, Guy, 4,683,296, Cl. 539-558.000.

Robert Bosch GmbH: *See*—
Bosch, Franz-Ulrich; Muller, Willi; Schacht, Hans; and Straubel, Max, 4,683,055, Cl. 210-120.000.
Kreuzer, Helmut; and Meier, Klaus-Peter, 4,682,410, Cl. 29-596.000.
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Roberts, Brian L.: *See*—
Moffitt, Michael S.; and Roberts, Brian L., 4,682,693, Cl. 206-583.000.

Roberts, Clyde D., to Telex Computer Products, Inc. Fixed/adjustable head mount. 4,683,507, Cl. 360-109.000.

Robinson, Peter V.: *See*—
Lin, Ju-Chui; Abbey, Kirk J.; Craun, Gary P.; and Robinson, Peter V., 4,683,271, Cl. 525-403.000.

Robotic Vision Systems, Inc.: *See*—
Schmidt, Richard; Stern, Howard; Mauro, Alex; and Ross, Joseph, 4,682,894, Cl. 356-375.000.

Roche, Michel: *See*—
Ferrari, Alphonse; Roche, Michel; and Dard, Jean-Claude, 4,683,476, Cl. 346-29.000.

Rockwell International Corporation: *See*—
Christe, Karl O., 4,683,129, Cl. 423-351.000.
Frankel, Milton B.; and Wilson, Edgar R., 4,683,085, Cl. 260-349.000.
Frankel, Milton B.; and Wilson, Edgar R., 4,683,086, Cl. 260-349.000.
Kohl, Arthur L., 4,682,985, Cl. 48-197.00R.
Soclof, Sidney I., 4,683,399, Cl. 313-537.000.
Wagner, William R., 4,682,471, Cl. 60-649.000.
Wagner, William R., 4,682,933, Cl. 415-172.00A.

Rodewald, Paul G., to Mobil Oil Corporation. Catalytic conversion with boron trifluoride treated zeolite. 4,683,051, Cl. 208-111.000.

Rodgers, James E., to United Aircraft Products, Inc. Rotating air bearing. 4,682,920, Cl. 409-231.000.

Roger, Francoise M. M.: *See*—
Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Francoise M. M.; Themont, Jean-Pierre; and Vachet, Andre J., 4,683,153, Cl. 428-1.000.

Rogers, Charles F., III. Electronic control and method for increasing efficiency of heating and cooling systems. 4,682,473, Cl. 62-89.000.

Rogers, Howard H.: *See*—
Stadnick, Steven J.; and Rogers, Howard H., 4,683,178, Cl. 429-101.000.

Rogers, William E.; and Borton, David N., to Power Kinetics, Inc. Concave mirror apparatus and method of construction. 4,682,865, Cl. 350-607.000.

Rohm and Haas Company: *See*—
Beckley, Ronald S.; Randow, Rodney L.; and Swift, Graham, 4,683,100, Cl. 260-513.00R.

Rokach, Joshua: *See*—
Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., 4,683,325, Cl. 560-10.000.

Rolls-Royce plc: *See*—
Buxton, Frank A.; and Barraclough, David J., 4,683,099, Cl. 264-511.000.
Newton, Arnold C., 4,682,733, Cl. 239-265.390.
Sutcliffe, David T.; and Barraclough, David J., 4,683,018, Cl. 156-196.000.

Rolscreen Company: *See*—
Klompenburg, Marlo V., 4,682,455, Cl. 52-207.000.

Ronning, Patricia M.; and Vandesteeg, Gregg A., to Minnesota Mining and Manufacturing Company. Compositions, devices, and methods for extended control of insect activity. 4,683,132, Cl. 424-409.000.

Roos, Otto: *See*—
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,683,238, Cl. 514-292.000.

Rosa, John, to Westinghouse Electric Corp. AC/DC or DC/AC converter system with outboard commutation inductors. 4,683,527, Cl. 363-5.000.

Rose, Gerard R.; Kaesler, Ralph W.; and Fong, Dodd W., to Nalco Chemical Company. Anionic flocculant for dewatering steel mill sludges. 4,683,066, Cl. 210-734.000.

Rosenblatt, Aaron A.: *See*—
Deffeves, Kenneth S.; and Rosenblatt, Aaron A., 4,683,318, Cl. 556-173.000.

Rosenthal, Brock J.: *See*—
Olsson, Mark S.; Hagey, William H.; and Rosenthal, Brock J., 4,683,523, Cl. 362-267.000.

Ross, Joseph: *See*—
Schmidt, Richard; Stern, Howard; Mauro, Alex; and Ross, Joseph, 4,682,894, Cl. 356-375.000.

Rouse, David M.; Wallace, Richard E.; and Zelms, Charles M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Data communication network. 4,683,563, Cl. 370-16.000.

Royalty Funding Ltd.: *See*—
Nelson, Robert G.; and Awtrey, James D., 4,683,457, Cl. 340-347.0AD.

Roze, Jean-Philippe: *See*—
Langpape, Reinhart; Dorrscheidt, Wolfgang; Roze, Jean-Philippe; and Steinleitner, Gunther, 4,683,179, Cl. 429-104.000.

Rubin, Albert M., to Singer Company, The. Diagnostic circuit utilizing bidirectional test data comparisons. 4,683,569, Cl. 371-25.000.

Rubin, Howard H.: *See*—
Doerfel, Stephen; Pokorny, Anthony G.; and Rubin, Howard H., 4,682,953, Cl. 434-16.000.

Ruckert, Edvard; and Golz, Gerhard, to Ewald Witte & Co. Device for the clamping connection of structural parts which are spaced from each other. 4,682,906, Cl. 403-409.100.

Rudolph, Steven M.; and Maxwell, Donald J., to Eidos Corporation. Low profile extensible support platform. 4,682,750, Cl. 248-421.000.

Ruggeri, Zaverio M.: *See*—
Zimmerman, Theodore S.; Ruggeri, Zaverio M.; and Houghten, Richard, 4,683,291, Cl. 530-324.000.

Ruhrkohle Aktiengesellschaft: *See*—
Becker, Wolfgang; and Tewes, Heinz, 4,683,032, Cl. 202-248.000.

Ruhter, Martin L.; and Loney, Allan F., to Deere & Company. Steering unit and control lever console for a vehicle. 4,682,787, Cl. 280-775.000.

Ruskey, Frank: *See*—
Oudenhoven, Martin S.; and Ruskey, Frank, 4,682,728, Cl. 236-12.120.

Ryabikov, Stanislav V.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Strebkov, Dmitry S.; and Ryabikov, Stanislav V., 4,682,841, Cl. 350-3.700.

Ryan, John M.: *See*—
Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., 4,683,007, Cl. 106-308.00M.

Ryan, Thomas G.: *See*—
Hartman, Thomas W.; and Ryan, Thomas G., 4,682,456, Cl. 52-221.000.

S. Bigagli & C. SpA: *See*—
Meroni, Roberto; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,682,466, Cl. 57-274.000.

S&C Electric Company: *See*—
Opfer, John C., 4,683,357, Cl. 200-153.0SC.

S. Franzen Sohne GmbH & Co. KG: *See*—
Werner, Hans U., 4,682,483, Cl. 70-312.000.

Saba, Mark T.: *See*—
Muscatello, Anthony C.; Navratil, James D.; and Saba, Mark T., 4,683,124, Cl. 423-6.000.

Sackmann, Dieter: *See*—
Brecht, Gerhard; and Sackmann, Dieter, 4,682,822, Cl. 303-20.000.

Saegertown Manufacturing Corporation: *See*—
Jordan, Chalmer; Connor, Lee; and Lybarger, Robert, 4,682,381, Cl. 10-63.000.

Sage, Donald B., Jr.: *See*—
Brannon, Robert C.; Sage, Donald B., Jr.; and Miller, David G., 4,683,254, Cl. 523-503.000.

Sahara, Masanori: *See*—
Nakamura, Saburo; Sakurai, Shigeru; Nishida, Takumi; and Sahara, Masanori, 4,682,576, Cl. 123-179.00A.

Saiki, Randall K.; and Erlich, Henry A., to Cetus Corporation. Method for detection of polymorphic restriction sites and nucleic acid sequences. 4,683,194, Cl. 435-6.000.

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Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schwarzenberg, Norbert; Radermacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, 4,682,997, Cl. 65-106.000.

St. Hilaire, Arthur: *See*—
Conigliaro, Anthony; St. Hilaire, Arthur; and De Yoreo, Sal G., 4,682,740, Cl. 241-282.100.

Saita, Koji: *See*—
Kume, Hisao; Nishihara, Tokihiro; Shirasaka, Hiroharu; Kanehira, Kenichi; and Saita, Koji, 4,682,965, Cl. 445-37.000.

Saito, Cyuichi: *See*—
Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cyuichi; and Ogawa, Hiroyasu, 4,682,681, Cl. 198-333.000.

Saito, Kenji; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nishimura, Yukuo; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Light scattering measuring apparatus. 4,682,897, Cl. 374-45.000.

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Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, to Sony Corporation. Scrambling system for an audio frequency signal. 4,683,586, Cl. 380-48.000.

Sakamoto, Masaharu: *See*—
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Sakamoto, Masami; Nagumo, Ryoichi; and Ishihara, Tamio, to Hitachi, Ltd. X-Y plotter drive roller arrangement. 4,683,480, Cl. 346-134.000.

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Nakamura, Morio; Obayashi, Shigeji; Yamamoto, Takushi; Nakanishi, Toshikazu; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,683,274, Cl. 526-216.000.

Sakka, Sumio: *See*—
Miyake, Yoshifumi; and Sakka, Sumio, 4,683,253, Cl. 523-442.000.

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Sakurai, Takayasu; and Iizuka, Tetsuya, to Kabushiki Kaisha Toshiba. Power-saving voltage supply. 4,683,382, Cl. 307-296.00R.

Salmon, Michael E.; and Hunkele, Paul W. Go-cart. 4,682,668, Cl. 180-209.000.

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Salvet, Miroslav: *See*—
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Salvetti, Gianemilio: *See*—
Armandillo, Errico; Salvetti, Gianemilio; and Giuliani, Giampiero, 4,682,893, Cl. 356-356.000.

Salzburg, Herbert; Hajek, Manfred; Hansler, Gerd; and Kuck, Varl-Heinz, to Bayer Aktiengesellschaft. Salts of 2-keto-2H, 3H-1,2-benzisothiazole 1,1-dioxide as microbicides. 4,683,233, Cl. 514-253.000.

San-Apro Kabushiki Kaisha: *See*—
Nakatani, Keiichi; Ohnishi, Shohzo; and Kurosaki, Tadamasa, 4,683,249, Cl. 521-129.000.

Sanduja, Mohan L.: *See*—
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Arrow, Martin, 4,682,438, Cl. 43-21.200.

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Nakahama, Ryoji, 4,682,961, Cl. 440-61.000.

Santostasi, Paul A.: *See*—
Dutt, Herbert V.; Foldesi, Istvan; and Santostasi, Paul A., 4,683,016, Cl. 156-69.000.

Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Urata, Keiji; and Kurome, Yoshio, 4,683,264, Cl. 525-65.000.

Sanyo Mikawa Body Corp.: *See*—
Ooguro, Yukito, 4,682,811, Cl. 296-181.000.

Sasagawa, Masaru: *See*—
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.

Sasakawa, Eishiro: *See*—
Kinoshita, Tomohiro; Tanabe, Seiichi; and Sasakawa, Eishiro, 4,683,177, Cl. 429-26.000.

Sasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus. 4,682,497, Cl. 73-602.000.

Sasaki, Kiichi: *See*—
Higuchi, Kazuo; Sugama, Takayuki; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,682,789, Cl. 280-801.000.

Sasaki, Susumu, to Fujitsu Limited. Digital radio communication system. 4,683,566, Cl. 370-100.000.

Sasano, Naoshige: *See*—
Kowata, Nobuo; and Sasano, Naoshige, 4,682,849, Cl. 350-96.220.

Sato, Fumio: *See*—
Cho, Hidetsura; Aisaka, Kazuo; Sato, Fumio; and Ishihara, Takafumi, 4,683,234, Cl. 514-256.000.

Satoh, Kimio: *See*—
Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, 4,683,093, Cl. 264-22.000.

Satren, Ernest A.: *See*—
Higashi, Robert E.; James, Steven D.; Johnson, Robert G.; and Satren, Ernest A., 4,682,503, Cl. 73-755.000.

Sauer, Heinz, to Rasmussen GmbH. Hose coupling. 4,682,798, Cl. 285-174.000.

Savenije, Franciscus G., to Auping b.v. Body support, such as a mattress. 4,682,378, Cl. 5-239.000.

Sawada, Tetsuya: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,682,743, Cl. 242-58.600.

Sawaf, Bernard: *See*—
Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, 4,682,689, Cl. 206-222.000.

Schacht, Hans: *See*—
Bosch, Franz-Ulrich; Muller, Willi; Schacht, Hans; and Straubel, Max, 4,683,055, Cl. 210-120.000.

Schad, Robert D., to Husky Injection Molding Systems Ltd. Thermal insulating and expansion assembly for injection molding machine. 4,682,945, Cl. 425-549.000.

Schaller, Klaus: *See*—
Stadler, Peter; Lockhoff, Oswald; Opitz, Hans-Georg; and Schaller, Klaus, 4,683,222, Cl. 514-42.000.

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Scharpenberg, Rainer, to Brown Boveri Reaktor GmbH. Equipment for the inspection of fuel rods of nuclear reactors. 4,683,104, Cl. 376-251.000.

Scharpey, Wilhelm; and Pawlek, Rudolf, to Swiss Aluminium Ltd. Reduction pot for the production of aluminum. 4,683,046, Cl. 204-243.00R.

Scherbarth, David W.: *See*—
Wu, Jiing-Liang; Scherbarth, David W.; and Marschik, David, 4,683,353, Cl. 200-8.00R.

Scherer, Jerome. Tool for removal of debris from pipe containing gas under pressure. 4,682,623, Cl. 137-317.000.

Schering Corporation: *See*—
McCombie, Stuart W., 4,683,226, Cl. 514-192.000.

Schier, J. Alan: *See*—
Steiner, Urs; Hurst, James; and Schier, J. Alan, 4,682,508, Cl. 73-866.500.

Schiffers, Ulrich: *See*—
Goebel, Konrad; and Schiffers, Ulrich, 4,682,620, Cl. 137-110.000.

Schimmel, Gunther: *See*—
Kolkmann, Friedrich; Ressel, Herbert; Gradl, Reinhard; and Schimmel, Gunther, 4,683,127, Cl. 423-321.00R.

Schlage Lock Company: *See*—
Smallegan, Jon M., 4,682,802, Cl. 292-337.000.

Schmidt, Alfred. Apparatus for limiting back pressure in an exhaust-type engine suppressor. 4,682,674, Cl. 188-273.000.

Schmidt, Gerhard, to Flour City Architectural Metals, Division of E.G. Smith Construction Products, Inc. Infrared radiant heater. 4,682,578, Cl. 126-91.00R.

Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., to International Business Machines Corporation. Alternately centered disk pack assembly and method. 4,683,505, Cl. 360-98.000.

Schmidt, Richard; Stern, Howard; Mauro, Alex; and Ross, Joseph, to Robotic Vision Systems, Inc. Calibration of three-dimensional space. 4,682,894, Cl. 356-375.000.

Schnegg, Julius, to Burlington Industries, Inc. Warp-knit, weft-inserted fabric with substrate and method and apparatus to produce same. 4,682,480, Cl. 66-192.000.

Schneider, Dallas J.: *See*—
Silvernail, James M.; and Schneider, Dallas J., 4,682,614, Cl. 134-99.000.

Schnitzer, Emanuel; and Williams, Leonard E., Jr., to Cameron Iron Works, Inc. Gas driven anchor and launching system therefor. 4,682,559, Cl. 114-295.000.

Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, to Boehringer Ingelheim KG. 2,3,4,9-tetrahydro beta carboline derivatives, useful as antihypertensive agents. 4,683,238, Cl. 514-292.000.

Schoeps, Jochen: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Morbitzer, Leo; Peters, Horst; Ott, Karl-Heinz; and Schoeps, Jochen, 4,683,265, Cl. 525-67.000.

Scholz, Donald T.; and Antoine, Augustine, to Scholz Research & Development. Electronic audio system. 4,683,589, Cl. 381-61.000.

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Scholz, Donald T.; and Antoine, Augustine, 4,683,589, Cl. 381-61.000.

Schomblond, Jacques, to Cartier Industrie. Injection molds for the manufacture of composite bodies. 4,682,943, Cl. 425-130.000.

Schoon, David J., to Minnesota Mining and Manufacturing Company. Ram clock switching circuitry for a laser beam printer. 4,683,551, Cl. 364-900.000.

Schorling, Stefan H. G.: *See*—
Andersson, Lars G. R.; and Schorling, Stefan H. G., 4,682,899, Cl. 384-41.000.

Schrantz, Gregory A., to Harris Corporation. Technique for increasing gate-drain breakdown voltage of ion-implanted JFET. 4,683,485, Cl. 357-22.000.

Schubert, Ernst: *See*—
Krakkay, Tibor; Poggi, Tatjana; and Schubert, Ernst, 4,683,286, Cl. 525-329.100.

Schubert, Keith E.: *See*—
Pollak, Philip, Jr.; and Schubert, Keith E., 4,682,541, Cl. 101-91.000.

Schukei, Glen E., to Combustion Engineering, Inc. High pressure nozzle dam. 4,682,630, Cl. 138-89.000.

Schultes, Tilmann, to Kortenbach & Rauh Kommanditgesellschaft. Umbrella with a mechanism for locking and releasing a slider. 4,682,616, Cl. 135-38.000.

Schultes, Tilmann; and Stiller, Klaus, to Kortenbach & Rauh Kommanditgesellschaft. Shortenable umbrella having a telescopic stick. 4,682,617, Cl. 135-38.000.

Schumacher, David D.: *See*—
Burkman, Don C.; Schumacher, David D.; and Peterson, Charlie A., 4,682,615, Cl. 134-102.000.

Schumacher, Percy W.: *See*—
Daly, Jeffery E.; and Schumacher, Percy W., 4,682,663, Cl. 175-329.000.

Schwarzenberg, Norbert: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schwarzenberg, Norbert; Radermacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, 4,682,997, Cl. 65-106.000.

Schwarzkopf, Anton, to Schwarzkopf GmbH, Firma; and Intamin Corporation. Amusement ride with vehicles supported by universally hinged wheel groups. 4,682,547, Cl. 104-53.000.

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Schwarzkopf, Anton, 4,682,547, Cl. 104-53.000.

Scobie, William B.; and Wagberg, Michael L., to Keystone International, Inc. Disk/stem connection apparatus for butterfly valve. 4,682,758, Cl. 251-84.000.

Scopas Technology Company, Inc., The: *See*—
Deffeves, Kenneth S.; and Rosenblatt, Aaron A., 4,683,318, Cl. 556-173.000.

Scott, Charles D., to United States of America, Energy. Method and apparatus for continuous annular electrochromatography. 4,683,042, Cl. 204-180.100.

Scott & Fetzer Company, The: *See*—
Prahl, Joseph M., 4,682,384, Cl. 15-344.000.

Scott, Lawrence M.; and Rexroat, Gary D., to Ampex Corporation. Magnetic iron oxide pigment and recording media. 4,683,167, Cl. 428-328.000.

Scott Paper Company: *See*—
Gotchel, Joel P.; Norton, Henry J.; Neuenschwander, Rudolf; and Stango, Daniel J., 4,682,942, Cl. 425-103.000.

Scott, Stephen E.: *See*—
McNeel, William O.; Montieth, Royel F.; and Scott, Stephen E., 4,682,831, Cl. 439-294.000.

Scovell, Peter D., to ITT Industries Inc. Microwave apparatus for processing semiconductor. 4,683,363, Cl. 219-10.55A.

Scripps Clinic and Research Foundation: *See*—
Carson, Dennis A., 4,683,295, Cl. 530-391.000.
Milich, David; and Chisari, Frank, 4,683,136, Cl. 424-89.000.
Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl. 514-14.000.
Zimmerman, Theodore S.; Ruggeri, Zaverio M.; and Houghten, Richard, 4,683,291, Cl. 530-324.000.

Seal, Michael, to D. Drukker & Zn. N.V. Travelling wave tube and helix for such travelling wave tube. 4,683,400, Cl. 315-3.500.

Securitron-Magnalock Corp.: *See*—
Cook, Robert C.; and Toeg, Sasson, 4,682,801, Cl. 292-251.500.

Seevers, Daniel B.: *See*—
Kelch, Russell K.; Finfrock, Don C.; Girard, Donald J.; Seevers, Daniel B.; Briggs, Barry D.; and Mathes, Gene R., 4,683,531, Cl. 364-200.000.

Seiko Epson Kabushiki Kaisha: *See*—
Ono, Yoichi, 4,683,183, Cl. 430-20.000.

Seiko Seiki Kabushiki Kaisha: *See*—
Inoue, Akira; Nomura, Shinichi; and Hanami, Osamu, 4,683,408, Cl. 318-696.000.

Seiner, Jerome A.: *See*—
Hodek, Robert B.; and Seiner, Jerome A., 4,683,344, Cl. 568-716.000.

Seitetsu Kagaku Co., Ltd.: *See*—
Nakamura, Morio; Obayashi, Shigeji; Yamamoto, Takushi; Nakanishi, Toshikazu; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,683,274, Cl. 526-216.000.

Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of sodium chloride. 4,683,040, Cl. 204-98.000.

Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for electrolysis of sodium chloride. 4,683,041, Cl. 204-98.000.

Selepouchin, Vladimir: *See*—
Lake, Ralph J., Jr.; Stern, Timothy R.; Sudol, George A.; and Selepouchin, Vladimir, 4,683,465, Cl. 340-700.000.

Selman, Gordon L.; and Midgley, Richard J., to Johnson Matthey & Company, Limited. Platinum group metal-containing alloy. 4,683,119, Cl. 420-444.000.

Serafini, Angelo: *See*—
Wells, Thomas J.; and Serafini, Angelo, 4,682,394, Cl. 29-173.000.

Seshimoto, Osamu: *See*—
Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, 4,683,048, Cl. 204-416.000.

Sevelinge, Gerard, to Framatome. Device for projecting solid particles for a vacuum centrifugal grinder. 4,682,739, Cl. 241-275.000.

Severson, Randall L.: *See*—
Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., 4,683,505, Cl. 360-98.000.

Seymour, James O., Jr.: *See*—
Taft, Jeffrey D.; and Seymour, James O., Jr., 4,683,493, Cl. 358-101.000.

SFE Technologies: *See*—
Carrico, Philip H., 4,682,565, Cl. 118-719.000.

Shadwell, Damian E.: *See*—
Rice, Roy W.; Kahn, Manfred; and Shadwell, Damian E., 4,683,161, Cl. 428-178.000.

Shaff, Gerald, to Echlin, Inc. Catalytic converter for exhaust gases. 4,682,470, Cl. 60-299.000.

Shah, Arvind: *See*—
Max, Jean-Joseph; and Shah, Arvind, 4,683,450, Cl. 333-202.000.

Shah, Madhukant A.: *See*—
Krause, Richard J.; Gugala, Zbigniew H.; and Shah, Madhukant A., 4,683,057, Cl. 210-232.000.

Shanklin, Garry L.: *See*—
Floyd, David T.; Shanklin, Garry L.; Lynch, Gordon E.; and Meitner, Gary H., 4,683,001, Cl. 106-3.000.

Sharaiha, Ammar: *See*—
De Burgat, Michel; Le Traon, Andre ; Pilet, Jean-Claude; and Sharaiha, Ammar, 4,683,417, Cl. 324-60.00C.

Sharp Kabushiki Kaisha: *See*—
Fujiwara, Katsuyoshi; Miwa, Yoshihisa; and Yoshiura, Shoichiro, 4,682,877, Cl. 355-3.00R.
Fukumoto, Shigeaki, 4,682,580, Cl. 126-299.00D.
Katoh, Itsurou, 4,682,879, Cl. 355-3.000.
Miyoshi, Shuji; and Hijikigawa, Masaya, 4,682,502, Cl. 73-723.000.
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,683,186, Cl. 430-84.000.
Taniguchi, Akihiko; Fukunaga, Takahiro; and Shimizu, Eiichi, 4,682,884, Cl. 355-51.000.
Uda, Kazutaka, 4,682,500, Cl. 73-705.000.

Sharps, Gordon V., Jr., to Mobil Oil Corporation. Process for producing oriented polyolefin films with enhanced physical properties. 4,683,094, Cl. 264-38.000.

Shatto, Howard L.; and Agon, Theodore L., to Shell Offshore Inc. Hydraulic stab connector. 4,682,913, Cl. 405-169.000.

Sheikh, Morris. Method for reduction of cod in water. 4,683,065, Cl. 210-668.000.

Shell Offshore Inc.: *See*—
Shatto, Howard L.; and Agon, Theodore L., 4,682,913, Cl. 405-169.000.

Shell Oil Company: *See*—
Bilhou, Jean L.; and Goodall, Brian L., 4,683,215, Cl. 502-107.000.
Diaz, Zaida; and Miller, James H., 4,683,347, Cl. 568-869.000.
Goudriaan, Johan C.; and Van der Burgt, Maarten J., 4,683,121, Cl. 422-197.000.
Slaugh, Lynn H., 4,683,218, Cl. 502-302.000.
van Dongen, Johannes C. M.; and Maekiaho, Leo B., 4,682,421, Cl. 33-302.000.
Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., 4,683,338, Cl. 568-12.000.

Shelton, Thomas V.: *See*—
Kerr, Jack R.; Dunsmore, Gerald L.; and Shelton, Thomas V., 4,682,924, Cl. 411-329.000.

Shelton, William S., to Joy Manufacturing Company. Secondary backseat for gate valve. 4,682,757, Cl. 251-77.000.

Sheng, Ping: *See*—
Bloch, Aaron N.; and Sheng, Ping, 4,683,160, Cl. 428-141.000.

Sherwood, Philip W.: *See*—
Dai, Shenghong A.; and Sherwood, Philip W., 4,683,302, Cl. 540-356.000.

Sheu, Muh-Chuan. Adjustable bookrack. 4,682,696, Cl. 211-43.000.

Shiba, Noriyuki: *See*—
Watanabe, Takemi; and Shiba, Noriyuki, 4,683,022, Cl. 156-505.000.

Shibata, Chiyoji: *See*—
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.

Shibata, Manabu; and Uragami, Akira, to Hitachi, Ltd. Integrated circuit having input and output drivers cascaded between I/O pads and internal circuitry. 4,683,384, Cl. 307-475.000.

Shibata, Michiyasu: *See*—
Kurama, Kenichiro; and Shibata, Michiyasu, 4,682,780, Cl. 279-79.000.

Shibata, Tohru: *See*—
Ishii, Kunio; and Shibata, Tohru, 4,683,341, Cl. 568-366.000.

Shields, Thomas A., to USM Corporation. Tack strip. 4,682,925, Cl. 411-461.000.

Shikakura, Kunio: *See*—
Shimada, Satoshi; Kitamura, Nobuo; Shikakura, Kunio; and Maeda, Namio, 4,683,491, Cl. 358-56.000.

Shikoku Kaken Kogyo Kabushiki Kaisha: *See*—
Motoki, Hideo, 4,683,019, Cl. 156-293.000.

Shimada, Satoshi; Kitamura, Nobuo; Shikakura, Kunio; and Maeda, Namio, to Sony Corporation. Display system comprising a plurality of display cells arranged in an X-Y matrix and a plurality of horizontal-extending blinds disposed adjacent the upper edges of the display cells in the rows of the matrix. 4,683,491, Cl. 358-56.000.

Shimase, Akira; Yamaguchi, Hiroshi; Haraichi, Satoshi; and Miyauchi, Tateoki, to Hitachi, Ltd. Apparatus for ion beam work. 4,683,378, Cl. 250-492.200.

Shimizu, Eiichi: *See*—
Taniguchi, Akihiko; Fukunaga, Takahiro; and Shimizu, Eiichi, 4,682,884, Cl. 355-51.000.

Shimizu, Yasuhiro: *See*—
Hirasawa, Kazushige; Shimizu, Yasuhiro; and Matsumura, Takemasa, 4,683,543, Cl. 364-513.000.

Shimizu, Yasumoto; and Matsudaira, Takeo, to 501 Hoya Corporation. Method of manufacturing an electroluminescent panel without any adverse influence on an underlying layer. 4,683,044, Cl. 204-192.260.

Shimono, Mamoru: *See*—
Murakami, Reiji; Hashimoto, Shinichi; Shimono, Mamoru; and Ide, Fumito, 4,682,769, Cl. 271-10.000.

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Hirohashi, Setsuo; Shimosato, Yukio; and Watanabe, Masahiko, 4,683,200, Cl. 435-68.000.
Shin -Etsu Chemical Co., Ltd.: *See—*
Hida, Yoshinori; and Kozakai, Shohei, 4,683,320, Cl. 556-453.000.
Shindler, Geoffrey A., executor: *See—*
Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; Mason, Margaret, executor; and Shindler, Geoffrey A., executor, 4,683,028, Cl. 162-275.000.
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Yamamoto, Etsuji; Kohno, Hideki; Kuroda, Masao; Matsui, Shigeru; and Shiono, Hidemi, 4,683,433, Cl. 324-309.000.
Shiozaki, Kenichi; and Kubo, Kanji, to Hitachi, Ltd. Storage control system using plural buffer address arrays. 4,683,533, Cl. 364-200.000.
Shipkowski, James P.; and Pearce, Phillip W., to Eastman Kodak Company. Apparatus and method for detecting a perforation on a web. 4,683,380, Cl. 250-548.000.
Shiraga, Jun: *See—*
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Shirahata, Kunikatsu: *See—*
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
Shiraishi, Motoatsu: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Showa Electric Wire & Cable Co. Ltd.: *See—*
Kowata, Nobuo; and Sasano, Naoshige, 4,682,849, Cl. 350-96.220.
Shriver, Frank L., to Adolph Coors Company. Bottle drying apparatus. 4,683,009, Cl. 134-30.000.
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Shuto, Hirotetsu: *See—*
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Shuto, Katsuichi: *See—*
Yamato, Masayuki; Kase, Hiroshi; Kawamoto, Isao; Kasai, Masaji; Shirahata, Kunikatsu; Deguchi, Takashi; Shuto, Katsuichi; Karasawa, Akira; Okachi, Ryo; and Nakayama, Kiyoshi, 4,683,220, Cl. 514-7.000.
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Siegel, Carole E.: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,683,243, Cl. 514-557.000.
Siemens Aktiengesellschaft: *See—*
Dempf, Josef; and Moser, Erich, 4,682,770, Cl. 271-176.000.
Dittmann, Michael, 4,683,358, Cl. 200-243.000.
Haas, Werner; Knuepfer, Wolfgang; and Pfeiler, Manfred, 4,682,600, Cl. 128-328.000.
Hauenstein, Alfred, 4,683,438, Cl. 323-288.000.
Heinen, Jochen, 4,683,574, Cl. 372-44.000.
Langenwalter, Michael; Moehrmann, Karl H.; Prussas, Herbert; and Spaeter, Lothar, 4,683,489, Cl. 357-81.000.
Mahlein, Hans F.; Michel, Herbert; Reichelt, Achim; and Winzer, Gerhard, 4,682,843, Cl. 350-96.150.
Naylor, Thomas K., 4,683,441, Cl. 330-69.000.
Siemon Company, The: *See—*
Thomas, Stephen M.; and Nitowski, Ronald, 4,682,837, Cl. 439-344.000.
Sigma Instruments, Inc.: *See—*
Beling, Thomas E., 4,683,472, Cl. 340-870.020.
Signode Corporation: *See—*
Figiel, Janusz; Tremper, Donald; and Lems, Peter, 4,683,017, Cl. 156-73.100.
Siliconix Incorporated: *See—*
Blanchard, Richard A.; and Plummer, James D., 4,682,405, Cl. 29-571.000.
Silver Seiko Limited: *See—*
Yoshino, Shigeru, 4,682,932, Cl. 414-744.00A.
Silverman, Michael D. Submersible personal stereo. 4,683,587, Cl. 381-25.000.
Silvernail, James M.; and Schneider, Dallas J., to FSI Corporation. Wafer processing machine. 4,682,614, Cl. 134-99.000.
Simbal, John J., to Minnesota Mining and Manufacturing Company. Ultra-wide angle micrographic lens. 4,682,863, Cl. 350-463.000.
SIMES S.p.A. Societa Italiana Medicinali e Sintetici: *See—*
Ferrari, Giorgio; and Vecchietti, Vittorio, 4,683,245, Cl. 514-652.000.
Simesa-Societa Italiana Montaggi e Servizi Affini S.p.A.: *See—*
Domenighetti, Domenico, 4,682,908, Cl. 404-84.000.
Simko, Aladar O., to Ford Motor Company. Low friction high speed rocker arm. 4,682,575, Cl. 123-90.440.
Simmons, Graham. Binder for articles such as books and cassettes. 4,682,792, Cl. 281-45.000.
Simmons, Ronald G. Adapters for golf shoes. 4,682,425, Cl. 36-44.000.
Simonds, John L.: *See—*
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Simpson, Harold G.; and Neyer, Leo E., to Harold Simpson, Inc. Standing seam roof assembly components. 4,682,454, Cl. 52-200.000.
Singer Company, The: *See—*
Rubin, Albert M., 4,683,569, Cl. 371-25.000.
Singhal, Gopal H., to Exxon Research and Engineering Company. Method of preparation of dithiocarbamate complexes of molybdenum (VI). 4,683,316, Cl. 556-38.000.
Singleton, William F.: *See—*
Macaulay, Malcolm; and Singleton, William F., 4,683,467, Cl. 340-705.000.
Sizemore, Billy G., to Sizemore, Winston C.; and Sizemore, Charles P., part interest to each. Support for reinforcing bar. 4,682,461, Cl. 52-689.000.
Sizemore, Charles P.: *See—*
Sizemore, Billy G., 4,682,461, Cl. 52-689.000.
Sizemore, Winston C.: *See—*
Sizemore, Billy G., 4,682,461, Cl. 52-689.000.
Skalka, Gerald P., to Victor Stanley, Inc. Playground equipment including vandal resistant mechanical assembly. 4,682,772, Cl. 272-113.000.
Skarstedt, Mark T.: *See—*
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,683,209, Cl. 436-14.000.
SKF Compagnie D'Applications Mecaniques: *See—*
Message, Olivier, 4,682,677, Cl. 192-41.00A.
SKF GmbH, Schweinfurt: *See—*
Olschewski, Armin, 4,682,972, Cl. 464-130.000.
Sklarski, Dennis J ; and Doyle, Arthur F., to Essex Group, Inc. Mica product. 4,683,162, Cl. 428-182.000.
Skoza, Thomas E.: *See—*
Holy, Stephen M., 4,682,774, Cl. 273-84.00R.
Slachetka, Joseph P.: *See—*
Noorily, Peter; and Slachetka, Joseph P., 4,682,836, Cl. 439-426.000.
Slaugh, Lynn H., to Shell Oil Company. Chlorine resistant shift gas catalyst. 4,683,218, Cl. 502-302.000.
Slavik, William H.; Carlson, William P.; Cepynsky, George L.; Dussault, Paul G.; Margison, Steven E.; and Wolf, James A., Jr., to Nuvatec, Inc. Data entry terminal and memory module therefor. 4,682,958, Cl. 434-335.000.
Sleep, Robert. Indicator device for a heat exchanger. 4,682,647, Cl. 165-11.100.
Sloan-Kettering Institute for Cancer Research: *See—*
Palladino, Michael, 4,683,199, Cl. 435-68.000.
Smallegan, Jon M., to Schlage Lock Company. Lock mechanism and a spring and cam assembly therefor. 4,682,802, Cl. 292-337.000.
Smeyers, Pierre A., to Nakachian, Raymond J., a part interest. Distributor or dripper for the micro-irrigation of soils. 4,682,730, Cl. 239-109.000.
Smith, Clinton R.: *See—*
Brewster, Phillip W.; Smith, Clinton R.; and Gowland, Frederick W., 4,683,069, Cl. 252-32.70E.
Smith, James E.: *See—*
Stiller, Alfred H.; and Smith, James E., 4,682,569, Cl. 123-55.00A.
Smith, Kevin W.: *See—*
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Smith Kline RIT, S.A.: *See—*
Van Wijnendaele, Frans; Gilles, Daniel; and Simonet, Guy, 4,683,294, Cl. 530-371.000.
Smith, Terrence R.: *See—*
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Smithey, Walter A.: *See—*
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SmithKline Beckman Corporation: *See—*
Demarinis, Robert M.; and Pfeiffer, Francis R., 4,683,229, Cl. 514-213.000.
Smiths Industries Public Limited Company: *See—*
Bax, Anton M., 4,683,413, Cl. 318-779.000.
Snel, Johannes J. M.: *See—*
Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., 4,683,338, Cl. 568-12.000.
Snow, Dane R.; and Bingham, David, to Intersil, Inc. Pulse position modulated regulation for power supplies. 4,683,528, Cl. 363-21.000.
Snowball, Malcolm R.; and Hayes, Cecil, to W. M. Still & Sons Limited. Coffee making apparatus incorporating metered dispensing. 4,682,537, Cl. 99-282.000.
Sobemi N.V.: *See—*
Vanhille, Andre A. F. L., 4,682,485, Cl. 72-133.000.
Socapex: *See—*
Tossutto, Jean F.; and Bricaud, Herve , 4,683,425, Cl. 324-158.00F.
Societe Nationale Elf Aquitaine: *See—*
Armand, Michel; Chabagno, Jean-Michel; Ricoux, Philippe; Vassort, Guy; Gauthier, Michel; Brochu, Fernand; and Rigaud, Philippe, 4,683,181, Cl. 429-192.000.
Payre, Didier; Crozat, Georges; and Spinner, Bernard, 4,682,476, Cl. 62-480.000.
Soclof, Sidney I., to Rockwell International Corporation. Silicon vacuum electron devices. 4,683,399, Cl. 313-537.000.

Sodeco-Saida AG: *See—*
Boillat, Pierre, 4,683,409, Cl. 318-696.000.
Soderlind, Jan: *See—*
Peterson, Lars-Eric; and Soderlind, Jan, 4,682,372, Cl. 2-51.000.
Sokolovsky, Paul J., to Advanced Micro Devices, Inc. Tape attach machine. 4,683,023, Cl. 156-518.000.
Soletanche: *See—*
Barthelemy, Herve ; and Legendre, Yves, 4,682,660, Cl. 175-96.000.
Sondergeld, Manfred A. J.; Dudek, Dietmar; and Hossner, Klaus, to Du Pont de Nemours, E. I., and Company. Process to lower the viscosity of coating solutions for the production of light-sensitive reproduction materials. 4,683,190, Cl. 430-281.000.
Sonnichsen, George: *See—*
Bergna, Horacio E.; Corbin, David R.; and Sonnichsen, George, 4,683,334, Cl. 564-474.000.
Sony Corporation: *See—*
Hata, Katsuhiko; Ohashi, Hisao; Honda, Keiji; and Yamakami, Takahiko, 4,682,962, Cl. 445-5.000.
Kume, Hisao; Nishihara, Tokihiro; Shirasaka, Hiroharu; Kanehira, Kenichi; and Saita, Koji, 4,682,965, Cl. 445-37.000.
Meguro, Niroshi, 4,683,510, Cl. 360-132.000.
Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, 4,683,586, Cl. 380-48.000.
Shimada, Satoshi; Kitamura, Nobuo; Shikakura, Kunio; and Maeda, Namio, 4,683,491, Cl. 358-56.000.
Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, 4,683,012, Cl. 148-301.000.
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Sostarich, Joseph J.: *See—*
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Soutar, Larry: *See—*
Reighard, Alan B.; and Soutar, Larry, 4,682,711, Cl. 222-75.000.
Southard, G. Lee, to Vipont Laboratories, Inc. Method for treating periodontal disease. 4,683,133, Cl. 424-49.000.
Southworth, Peter R.; and Baxter, Gregory R., to Nacom Industries, Incorporated. Conveyor system. 4,682,927, Cl. 414-217.000.
Spaeter, Lothar: *See—*
Langenwalter, Michael; Moehrmann, Karl H.; Prussas, Herbert; and Spaeter, Lothar, 4,683,489, Cl. 357-81.000.
Sparkle Wash, Inc.: *See—*
Betts, James F., 4,683,008, Cl. 134-27.000.
Sparrow, Ian H., to Trent Jetfloor Limited. Dry laid floors. 4,682,458, Cl. 52-309.800.
Spectra-Physics, Inc.: *See—*
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,683,575, Cl. 372-59.000.
Spectrospin AG: *See—*
Tschopp, Werner, 4,683,434, Cl. 324-320.000.
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Spencer, Richard O. Open office landscape system. 4,682,457, Cl. 52-239.000.
Speranza, George P.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,683,272, Cl. 525-404.000.
Spiering, Johan R. Roll-up Velcro tool carrier. 4,682,691, Cl. 206-373.000.
Spinner, Bernard: *See—*
Payre, Didier; Crozat, Georges; and Spinner, Bernard, 4,682,476, Cl. 62-480.000.
Spofa spojene podniky pro zdravotnickou: *See—*
Kuchar, Miroslav; Brunova, Bohumila; Grimova, Jaroslava; and Maturova, Eva, 4,683,331, Cl. 562-459.000.
Spolyar, John L. Portable roentgenographic cephalostat. 4,683,582, Cl. 378-174.000.
Springs Industries, Inc.: *See—*
Dugan, Jeffrey S., 4,682,379, Cl. 5-500.000.
Spruit, Johannes H. M.: *See—*
Vriens, Leendert; Clark, John A.; and Spruit, Johannes H. M., 4,683,398, Cl. 313-474.000.
Srivastava, Vinai K.: *See—*
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Stacey, Robert E.: *See—*
Leege, James W.; Stacey, Robert E.; and Uttke, Russell H. C., 4,682,687, Cl. 198-852.000.
Stackman, Robert W., to Celanese Corporation. Anisotropic heat-curable acrylic terminated monomers. 4,683,327, Cl. 560-86.000.
Stadler, Peter; Lockhoff, Oswald; Opitz, Hans-Georg; and Schaller, Klaus, to Bayer Aktiengesellschaft. N-glycosylated carboxamide derivatives and their use for influencing the body's inherent defences. 4,683,222, Cl. 514-42.000.
Stadnick, Steven J.; and Rogers, Howard H., to Hughes Aircraft Company. Process for preventing electrical storage cell capacity loss. 4,683,178, Cl. 429-101.000.
Staehle, Brad G.: *See—*
Burton, John H.; and Staehle, Brad G., 4,682,583, Cl. 128-1.00R.
Stairmand, John W.: *See—*
Bellhouse, Brian J.; and Stairmand, John W., 4,682,887, Cl. 356-39.000.
Stalter, Bernadette M., executrix: *See—*
Stalter, Joseph F., deceased; and Feller, Gilbert M., 4,683,021, Cl. 156-415.000.
Stalter, Joseph F., deceased (by Stalter, Bernadette M., executrix); and Feller, Gilbert M., to Goodyear Tire & Rubber Company, The. Tire building drum. 4,683,021, Cl. 156-415.000.
Stalter, Robert J., to Motor Wheel Corporation. Vehicle wheel with an ornamental plastic overlay. 4,682,820, Cl. 301-37.00P.
Stamicarbon B.V.: *See—*
Van Geenen, Albert A.; and Bongers, Jozef J. M., 4,683,304, Cl. 540-529.000.
Stango, Daniel J.: *See—*
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Stanley Electric Co., Ltd.: *See—*
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Starner, William E.: *See—*
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Stauble, Georg: *See—*
Hommen, Winfried; Stauble, Georg; and Wieser, Tiberius, 4,682,823, Cl. 303-22.00R.
Stauffer Chemical Company: *See—*
Chavdarian, Charles G., 4,683,225, Cl. 514-128.000.
Ste Look, French Societe Anonyme: *See—*
Peyre, Henri, 4,682,786, Cl. 280-628.000.
Steele, Bruce L., to Odetics, Inc. High efficiency magnetic erase head. 4,683,509, Cl. 360-119.000.
Steele, Douglas S.; Little, Francis H.; Sostarich, Joseph J.; and Ingram, Douglas E., to General Electric Company. Ionization detector. 4,682,964, Cl. 445-28.000.
Steifensand, F. Martin. Chair. 4,682,815, Cl. 297-300.000.
Steiner, Urs; Hurst, James; and Schier, J. Alan, to Finnigan Corporation. Inlet valve for probe apparatus. 4,682,508, Cl. 73-866.500.
Steinke, Alexander: *See—*
Fromel, Gustav; and Steinke, Alexander, 4,683,115, Cl. 376-439.000.
Steinkolk, Richard B.: *See—*
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Steinleitner, Gunther: *See—*
Langpape, Reinhart; Dorrscheidt, Wolfgang; Roze, Jean-Philippe; and Steinleitner, Gunther, 4,683,179, Cl. 429-104.000.
Steltenkamp, Robert J.; and Camara, Michael A., to Colgate-Palmolive Company. Antistatic N-higher mono alkyl and mono alkenyl neoalkanamides, processes for manufacturing thereof, antistatic compositions containing such amides, and processes for decreasing accumulations of static charges on laundry. 4,682,982, Cl. 8-137.000.
Stephenson, Debra A. Flooring system. 4,682,459, Cl. 52-390.000.
Stern, Howard: *See—*
Schmidt, Richard; Stern, Howard; Mauro, Alex; and Ross, Joseph, 4,682,894, Cl. 356-375.000.
Stern, Timothy R.: *See—*
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Steven, Hubert: *See—*
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Stewart, Alexander W.: *See—*
Morissette, Pierre; Stewart, Alexander W.; and Taylor, Keith H., 4,682,505, Cl. 73-862.340.
Stewart, David: *See—*
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Stichting Centruum Voor Micro Electronika Twente: *See—*
de Ridder, Rene M.; and Fluitman, Johannes H. J., 4,683,535, Cl. 324-249.000.
Stiller, Alfred H.; and Smith, James E., to West Virginia University. Oscillatory motion apparatus. 4,682,569, Cl. 123-55.00A.
Stiller, Klaus: *See—*
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Stindt, Wilfried: *See—*
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Stokes, Vijay K., to General Electric Company. Reinforced rotor assembly and method of making same. 4,683,393, Cl. 310-156.000.
Stoler, Arie, to Israel Aircraft Industries Ltd. Taut wire fence system and sensor therefor. 4,683,356, Cl. 200-61.930.
Stolfa, Kazimir. Metal cutter. 4,682,416, Cl. 30-228.000.
Stoll, Kurt. Guide housing for the linearly moving output element of a cylinder actuator. 4,682,535, Cl. 92-165.0PR.
Stoll, Mark S., to Liberty Diversified Industries, Inc. Utility tote container. 4,682,727, Cl. 229-915.000.
Stoorza, Kenneth W.: *See—*
Elsmore, Jeff; Stoorza, Kenneth W.; and Walker, Timothy A., 4,683,469, Cl. 340-723.000.
Storage Technology Corporation: *See—*
Todd, Christian A.; and Hart, William D., 4,682,993, Cl. 55-314.000.
Strater, Fritz. Adjustable copyholder with articulated arms. 4,682,749, Cl. 248-284.000.
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Straver, William A. Animal trap. 4,682,441, Cl. 43-61.000.

Strazis, Steven L., to Arendt, Chris, a part interest. Bicycle wheel cover assembly. 4,682,821, Cl. 301-37.00R.

Strebkov, Dmitry S.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Strebkov, Dmitry S.; and Ryabikov, Stanislav V., 4,682,841, Cl. 350-3.700.

Stricker, Charles D.: *See*—
Bakewell, Frank W.; and Stricker, Charles D., 4,683,175, Cl. 428-677.000.

Stroetmann, Michael: *See*—
Zimmermann, Eberhard; and Stroetmann, Michael, 4,683,142, Cl. 427-2.000.

Strohm, Wilbur J., Jr. Linear weaving machine. 4,682,637, Cl. 140-9.000.

Strolle, Christopher H.; Smith, Terrence R.; and Hadwen, Brian M., to RCA Corporation. Video signal processing apparatus. 4,683,490, Cl. 358-30.000.

Struwe, Hartmut: *See*—
Brunke, Ernst-Joachim; and Struwe, Hartmut, 4,683,083, Cl. 252-522.00R.

Sturm, Budd H., to Goodyear Tire & Rubber Company, The. Para-nitrodiphenylamine synthesis. 4,683,332, Cl. 564-414.000.

Stutenkemper, Paul: *See*—
Hurten, Oskar; Vogt, Hans; and Stutenkemper, Paul, 4,682,812, Cl. 296-195.000.

Sudol, George A.: *See*—
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Sugama, Takayuki: *See*—
Higuchi, Kazuo; Sugama, Takayuki; Okuhara, Hisakazu; and Sasaki, Kiichi, 4,682,789, Cl. 280-801.000.

Sugathan, Kenneth K.: *See*—
Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., 4,683,007, Cl. 106-308.00M.

Sugimori, Shigeru; Goto, Yasuyuki; and Ogawa, Tetsuya, to Chisso Corporation. Dihalogeno-aromatic compound. 4,683,078, Cl. 252-299.610.

Sugio, Akitoshi; Okabe, Masao; and Amagai, Akikazu, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition having excellent fire retardancy. 4,683,255, Cl. 524-151.000.

Sugita, Takehiro: *See*—
Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, 4,683,586, Cl. 380-48.000.

Sugiura, Susumu; and Kohzato, Yasuo, to Canon Kabushiki Kaisha. Method and apparatus for recording a full-color image with a plurality of colorants on the basis of a set of area factors for the colorants selected from a plurality of sets of area factors calculated from a plurality of sets of equations. 4,683,492, Cl. 358-80.000.

Sugiyama, Genpei: *See*—
Suzuki, Nobuo; Okamura, Kikuko; Sugiyama, Genpei; and Suzuka, Susumu, 4,683,188, Cl. 430-110.000.

Suh, Jung J.; and Hong, You H., to YuHan Corporation Co., Ltd. Process for the preparation of 3,4-dihydro-2-substituted-2H-1,2-thiazine-carboxylic acid 1,1-dioxide derivatives. 4,683,306, Cl. 544-33.000.

Sukegawa, Osamu: *See*—
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Sulzer Brothers Limited: *See*—
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Sumitomo Chemical Company, Limited: *See*—
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Sumitomo Electric Industries, Ltd.: *See*—
Yuto, Masso; and Suzuki, Yoichi, 4,683,166, Cl. 428-314.800.

Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Hydraulic servo for friction coupling element of automatic transmission. 4,682,534, Cl. 92-130.00R.

Summerville, Don S.: *See*—
Brandes, John H.; King, Eddie W.; and Summerville, Don S., 4,682,709, Cl. 221-2.000.

Sun Chemical Corporation: *See*—
Lindemann, Martin K.; and Deacon, Kim, 4,683,165, Cl. 428-290.000.

Sun Coast Plastics, Inc.: *See*—
Dutt, Herbert V.; Foldesi, Istvan; and Santostasi, Paul A., 4,683,016, Cl. 156-69.000.

Sun, Han-Ching. Rake. 4,682,464, Cl. 56-400.170.

Sun Refining and Marketing Company: *See*—
Angstadt, Howard P., 4,682,653, Cl. 166-303.000.

Sun, Robert J. Slip case package. 4,682,974, Cl. 493-55.000.

Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 4,682,702, Cl. 215-232.000.
Montgomery, Gary; and Hawkins, Gene, 4,682,700, Cl. 215-216.000.

Sundstrand Corporation: *See*—
Readman, John; and Bland, Timothy J., 4,683,389, Cl. 310-62.000.
Riordan, R. Michael, 4,682,938, Cl. 418-1.000.
Weber, Kent, 4,682,622, Cl. 137-154.000.

Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks, Inc. Analgesic and anti-inflammatory compositions comprising diphenhydramine and methods of using same. 4,683,243, Cl. 514-557.000.

Suntory Limited: *See*—
Cho, Hidetsura; Aisaka, Kazuo; Sato, Fumio; and Ishihara, Takafumi, 4,683,234, Cl. 514-256.000.

Supergas Ltd: *See*—
Cooper, Graham H. B.; and Williams, John A., 4,682,627, Cl. 137-572.000.

Sutcliffe, David T.; and Barraclough, David J., to Rolls-Royce plc. Composite material manufacture by shaping individual sheets followed by consolidating the sheets. 4,683,018, Cl. 156-196.000.

Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Uezu, Kazuo; Maehara, Hidejirou; and Momose, Masanori, to Ricoh Company, Ltd. Printer with detachably mountable ink ribbon cassette. 4,683,478, Cl. 346-76.0PH.

Suzuka, Susumu: *See*—
Suzuki, Nobuo; Okamura, Kikuko; Sugiyama, Genpei; and Suzuka, Susumu, 4,683,188, Cl. 430-110.000.

Suzuki, Hideo: *See*—
Watanabe, Kuniaki; and Suzuki, Hideo, 4,682,718, Cl. 222-591.000.

Suzuki, Koji, to Canon Kabushiki Kaisha. Surface potential electrometer and image forming apparatus using the same. 4,683,436, Cl. 324-458.000.

Suzuki, Nobuo; Okamura, Kikuko; Sugiyama, Genpei; and Suzuka, Susumu, to Hodogaya Chemical Co., Ltd. Electrophotographic toner containing metal complex charge control agent. 4,683,188, Cl. 430-110.000.

Suzuki, Ryoichi; Taka, Hideo; and Tamura, Shuichi, to Canon Kabushiki Kaisha. Signal processing apparatus for a semiconductor position sensing device. 4,682,872, Cl. 354-403.000.

Suzuki, Ryozo; Shiraga, Jun; Iwai, Shingo; and Okashiro, Tetuo, to Mitsubishi Denki Kabushiki Kaisha. Fuel supplying pump. 4,682,936, Cl. 417-366.000.

Suzuki, Tadashi, to Canon Kabushiki Kaisha. Image forming system having external signal generating means. 4,682,875, Cl. 355-3.00R.

Suzuki, Tatsuo, to Terumo Corporation. Puncture needle assembly. 4,682,980, Cl. 604-122.000.

Suzuki, Tatsuo; and Matsumoto, Atsushi, to Terumo Kabushiki Kaisha. Medical device. 4,682,981, Cl. 604-158.000.

Suzuki, Toshio, to Toray Silicone Co., Ltd. Alkenyl organopolysiloxane and curable composition therefrom. 4,683,278, Cl. 528-32.000.

Suzuki, Yasuo; and Ando, Yasunori, to Nissin Electric Co., Ltd. Film forming process. 4,683,149, Cl. 427-38.000.

Suzuki, Yoichi: *See*—
Yuto, Masso; and Suzuki, Yoichi, 4,683,166, Cl. 428-314.800.

Svendsen, John M.: *See*—
Petersen, Walter J.; and Svendsen, John M., 4,683,370, Cl. 219-370.000.

Swedlow, Inc.: *See*—
Holdridge, David W., 4,682,856, Cl. 350-319.000.

Swenson, Clark E.: *See*—
Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., 4,683,365, Cl. 219-121.0LC.

Swift, Graham: *See*—
Beckley, Ronald S.; Randow, Rodney L.; and Swift, Graham, 4,683,100, Cl. 260-513.00R.

Swiss Aluminium Ltd.: *See*—
Scharpey, Wilhelm; and Pawlek, Rudolf, 4,683,046, Cl. 204-243.00R.

Sylvan, Richard: *See*—
Handler, Milton E.; Sylvan, Richard; and Peterson, Michael, 4,682,698, Cl. 211-70.600.

Syquest Technology: *See*—
Toldi, George; Nigam, Anil; Crain, Ronald; and Mercurio, Dominic, 4,683,506, Cl. 360-105.000.

Systemate B.V.: *See*—
Hazenbroek, Jacobus E.; Verrijp, Bastiaan; and Wallbridge, William L., 4,682,386, Cl. 17-46.000.

Szluk, Nicholas J.: *See*—
Miller, Gayle W.; Szluk, Nicholas J.; Maheras, George; and Metz, Werner A., Jr., 4,682,404, Cl. 29-571.000.

Tadashi, Hirata; Yoshirou, Satou; and Yoshimitsu, Tsutsui, to Amada Company, Limited. Multiple processing machine. 4,682,401, Cl. 29-568.000.

Taft, Jeffrey D.; and Seymour, James O., Jr., to Westinghouse Electric Corp. Compact optical apparatus for tracking a path of movement of a tool along a line of travel on a workpiece. 4,683,493, Cl. 358-101.000.

Tagliavini, Antonio. Electronic device for curative stimulation of the body. 4,682,601, Cl. 128-422.000.

Taguchi, Yoshio: *See*—
Kato, Masayuki; Taguchi, Yoshio; Imai, Chihiro; and Makishima, Tokuo, deceased, 4,683,275, Cl. 526-262.000.

Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, to Toyo Seikan Kaisha Ltd. Metal vessel having circumferential side seam and adhesive primer for use in production thereof. 4,683,263, Cl. 525-57.000.

Taisei Road Construction Co., Ltd.: *See*—
Mihara, Tohru, 4,682,909, Cl. 404-90.000.

Tajima, Akira: *See*—
Tanaka, Kazuo; and Tajima, Akira, 4,682,860, Cl. 350-423.000.

Taka, Hideo: *See*—
Suzuki, Ryoichi; Taka, Hideo; and Tamura, Shuichi, 4,682,872, Cl. 354-403.000.

Takach, Peter E.: *See*—
Morrissey, Denis M.; Takach, Peter E.; and Zeblisky, Rudolph J., 4,683,036, Cl. 204-15.000.

Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling hydraulically-operated power transmitting system including continuously variable transmission. 4,682,518, Cl. 74-867.000.

Takagi, Atushi: *See*—
Tokuda, Wahei; and Takagi, Atushi, 4,682,882, Cl. 355-14.00D.

Takahama, Kazuhide: *See*—
Horiya, Keiichi; Takahama, Kazuhide; and Usami, Yutaka, 4,683,479, Cl. 346-76.0PH.

Takahashi, Susumu: *See*—
Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki; Umemoto, Yasunari; and Tsukada, Toshihisa, 4,683,487, Cl. 357-34.000.

Takahashi, Tohru: *See*—
Kanbe, Junichiro; Okada, Shinjiro; Takahashi, Tohru; and Ando, Yujiro, 4,682,858, Cl. 350-334.000.

Takaki, Masaoki, to Hitachi, Ltd.; and Hitachi Control Systems, Inc. Sequence control method and apparatus. 4,683,549, Cl. 364-900.000.

Takamagari, Munenori: *See*—
Kasai, Minoru; Oka, Takao; Takamagari, Munenori; Shibata, Chiyoji; and Nakamura, Minoru, 4,682,385, Cl. 17-45.000.

Takamiya, Kikuzo; and Hideyuki, Ishibashi, to Bridgestone Cycle Co., Ltd. Adjustable handlebar for bicycle. 4,682,509, Cl. 74-551.400.

Takanashi, Nobuaki: *See*—
Ikeda, Hiroki; and Takanashi, Nobuaki, 4,683,406, Cl. 318-568.000.

Takayama, Takeshi: *See*—
Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, 4,683,048, Cl. 204-416.000.

Takebayashi, Koji, to Matsushita Electronics Corporation. Method for making field oxide region with self-aligned channel stop implantation. 4,682,408, Cl. 29-576.00W.

Takebe, Norichika. Elastic electric cable. 4,683,349, Cl. 174-69.000.

Takeda Chemical Industries, Ltd.: *See*—
Tanaka, Motoaki; Ogawa, Yasuaki; Miyagawa, Tsutomu; and Watanabe, Toshio, 4,683,288, Cl. 528-361.000.

Takeda, Kazuma; and Igarashi, Tsutomu, to Alpine Electronics Inc. Device for protecting audio equipment in vehicle against theft. 4,683,462, Cl. 340-571.000.

Takeda, Shigeki; and Maekawa, Sachio, to Hashimoto Denki Co., Ltd. Apparatus for cutting veneer pieces into equal sections. 4,682,639, Cl. 144-2.00R.

Takeuchi, Hiroshi; Nakaya, Chitose; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Composite ultrasonic transducers and methods for making same. 4,683,396, Cl. 310-358.000.

Takeuchi, Toyoaki; Ohshima, Ken; Kenjyo, Hideyuki; Ikeda, Yoshiaki; and Sakamoto, Masaharu, to Olympus Optical Company, Ltd. Microprocessor controlled focussing servo acquisition. 4,683,560, Cl. 369-45.000.

Takigawa, Hideaki: *See*—
Takizawa, Tatsuji; Noda, Nobutaka; and Takigawa, Hideaki, 4,682,878, Cl. 355-3.0FU.

Takimoto, Hiroshi: *See*—
Mirua, Konoe; Takimoto, Hiroshi; Kaneko, Toshio; Ohta, Tokuya; Kobayashi, Masatsune; and Eida, Tsuyoshi, 4,683,002, Cl. 106-20.000.

Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Information signal reproducing apparatus having means for discriminating a track pitch and selecting the reproduction mode speed. 4,683,503, Cl. 360-64.000.

Takizawa, Tatsuji; Noda, Nobutaka; and Takigawa, Hideaki, to Katsuragawa Denki Kabushiki Kaisha. Fixing devices for electrophotographic apparatus. 4,682,878, Cl. 355-3.0FU.

Talwar, Ashok K.; Poole, William E., Jr.; and Steinkolk, Richard B., to Eaton Corporation. Varactor tuning circuit for dielectric resonator stabilized oscillator. 4,683,447, Cl. 331-177.00V.

Tamas, Attila J., to Clark Equipment Company. Battery mounting device. 4,682,751, Cl. 248-503.000.

Tamba, Shinichi: *See*—
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,682,573, Cl. 123-90.200.

Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, to Orion-Yhtyma. Apparatus for X-ray photography of the area of the dentition and of the jaws. 4,683,581, Cl. 378-38.000.

Tamura, Shuichi: *See*—
Suzuki, Ryoichi; Taka, Hideo; and Tamura, Shuichi, 4,682,872, Cl. 354-403.000.

Tamura, Tadashi: *See*—
Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, 4,682,518, Cl. 74-867.000.

Tan, Peng. Liquid crystal hot spot detection with infinitesimal temperature control. 4,682,857, Cl. 350-331.00T.

Tanabe, Seiichi: *See*—
Kinoshita, Tomohiro; Tanabe, Seiichi; and Sasakawa, Eishiro, 4,683,177, Cl. 429-26.000.

Tanabe, Tsuneaki: *See*—
Inoue, Akio; and Tanabe, Tsuneaki, 4,683,261, Cl. 524-566.000.

Tanaka, Hideaki: *See*—
Fujita, Kunihiro; and Tanaka, Hideaki, 4,682,973, Cl. 474-263.000.

Tanaka, Hideki: *See*—
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.

Tanaka, Hitoshi: *See*—
Nakamura, Morio; Obayashi, Shigeji; Yamamoto, Takushi; Nakanishi, Toshikazu; Tanaka, Hitoshi; and Sakamoto, Yuji, 4,683,274, Cl. 526-216.000.

Tanaka, Kazuo; and Tajima, Akira, to Canon Kabushiki Kaisha. Ultrasmall size zoom lens. 4,682,860, Cl. 350-423.000.

Tanaka, Motoaki; Ogawa, Yasuaki; Miyagawa, Tsutomu; and Watanabe, Toshio, to Waco Pure Chemical Ind. Inc.; and Takeda Chemical Industries, Ltd. Polymer and its production. 4,683,288, Cl. 528-361.000.

Tanaka, Tomio: *See*—
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

Tandem Computers Incorporated: *See*—
Ferchau, Joerg U.; and Trujillo, Victor D., 4,682,833, Cl. 439-377.000.
Wang, Hsienchin W., 4,683,383, Cl. 307-473.000.

Tandy, Mark P.: *See*—
Eastman, Robert J.; and Tandy, Mark P., 4,682,540, Cl. 101-32.000.

Tani, Tadaaki: *See*—
Ihama, Mikio; Tani, Tadaaki; and Ohnishi, Hiroshi, 4,683,193, Cl. 430-570.000.

Taniguchi, Akihiko; Fukunaga, Takahiro; and Shimizu, Eiichi, to Sharp Kabushiki Kaisha. Mechanism for adjusting the starting position of sliding table of an electrophotographic copying machine. 4,682,884, Cl. 355-51.000.

Taniguti, Ryousuke, to Mitsubishi Denki Kabushiki Kaisha. Vibration monitoring apparatus. 4,683,542, Cl. 364-508.000.

Tatani, Atsushi: *See*—
Onizuka, Masakazu; Tatani, Atsushi; Hamada, Takayoshi; and Omoto, Setsuo, 4,683,210, Cl. 436-50.000.
Onizuka, Masakazu; Tatani, Atsushi; and Hamada, Takayoshi, 4,683,211, Cl. 436-50.000.

Tatano, Toshio: *See*—
Aoyama, Norihito; Miike, Akira; Okano, Mikio; and Tatano, Toshio, 4,683,208, Cl. 436-12.000.

Taylor, Frank S.; and Bourdon, Claude, to Monitronik Ltee. Self-supporting element for mosaic display panel. 4,682,432, Cl. 40-573.000.

Taylor, Gary N.: *See*—
Miller, David A.; Moran, Joseph M.; and Taylor, Gary N., 4,683,024, Cl. 156-643.000.

Taylor, Keith H.: *See*—
Morissette, Pierre; Stewart, Alexander W.; and Taylor, Keith H., 4,682,505, Cl. 73-862.340.

Taylor, Malcolm E.: *See*—
Pereira, Joseph J.; Taylor, Malcolm E.; and Sawaf, Bernard, 4,682,689, Cl. 206-222.000.

Tazou, Ken: *See*—
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, 4,682,685, Cl. 198-621.000.

Technicon Instruments Corporation: *See*—
Uffenheimer, Kenneth F., 4,683,212, Cl. 436-52.000.

Tecumseh Products Company: *See*—
Kaufman, Vernon R.; and Geringer, Miles S., 4,682,571, Cl. 123-73.00A.

Teets, Bradley, to Iscar Ltd. Center height gage for cut-off tools. 4,682,420, Cl. 33-626.000.

Teijin Limited: *See*—
Yasuoka, Toshio, 4,683,158, Cl. 428-95.000.

Tektronix, Inc.: *See*—
Zimmerman, Matt J., 4,683,415, Cl. 323-282.000.

Telemecanique Electrique: *See*—
Quatse, Jesse T., 4,683,530, Cl. 364-200.000.

Telex Computer Products, Inc.: *See*—
Roberts, Clyde D., 4,683,507, Cl. 360-109.000.

Tenenbaum, Martin, to Dakten Products Corp. Cooling system monitor. 4,682,493, Cl. 73-118.100.

Tenneco Canada Inc. (ERCO division): *See*—
Twardowski, Zbigniew; and McGilvery, James D., 4,683,039, Cl. 204-95.000.

Teranishi, Katsuya; Ozima, Kazuhira; Saito, Cyuichi; and Ogawa, Hiroyasu, to Hitachi, Ltd. Escalator. 4,682,681, Cl. 198-333.000.

Terrell, Michael S., to Duke Power Company. Material sampling apparatus. 4,682,507, Cl. 73-863.570.

Terumo Corporation: *See*—
Suzuki, Tatsuo, 4,682,980, Cl. 604-122.000.

Terumo Kabushiki Kaisha: *See*—
Kasai, Masaaki; and Ishikawa, Kenji, 4,682,703, Cl. 215-247.000.
Suzuki, Tatsuo; and Matsumoto, Atsushi, 4,682,981, Cl. 604-158.000.

Tetra Pak International AB: *See*—
Lothman, Stig A., 4,682,684, Cl. 198-461.000.

Tewes, Heinz: *See*—
Becker, Wolfgang; and Tewes, Heinz, 4,683,032, Cl. 202-248.000.

Texaco Inc.: *See*—
Cuscurida, Michael; and Speranza, George P., 4,683,272, Cl. 525-404.000.
Huang, Wann-Sheng; and Hight, Margaret A., 4,682,652, Cl. 166-263.000.
Knifton, John F.; and Grice, Neal J., 4,683,335, Cl. 564-480.000.
Lin, Chew-Chen; Brown, Winthrop K.; Lankford, Frank L., Jr.; Greenhill, Katherine L.; and Campsey, Ronald L., 4,683,464, Cl. 340-685.000.

Texas A&M University: *See*—
Costello, David, 4,682,895, Cl. 356-402.000.

Texas Instruments Incorporated: *See*—
Chatterjee, Pallab K., 4,683,486, Cl. 357-23.600.
Pinkham, Raymond, 4,683,555, Cl. 365-215.000.
Weber, Richard M., 4,682,669, Cl. 181-114.000.

Texpa Arbter Machinenbau GmbH: *See*—
Bierbaum, Joe; Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,682,555, Cl. 112-262.100.

Tezuka, Junichi: *See*—
Murata, Yasuto; Tezuka, Junichi; and Yamamoto, Kenji, 4,683,045, Cl. 204-206.000.

Thackston, Ronald L.: *See*—
Williams, A. Graves, III; and Thackston, Ronald L., 4,682,917, Cl. 408-212.000.

Themont, Jean-Pierre: *See*—
Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Francoise M. M.; Themont, Jean-Pierre; and Vachet, Andre J., 4,683,153, Cl. 428-1.000.

Thoman, Marilyn L.: *See*—
Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., 4,683,221, Cl. 514-14.000.

Thomas, Andrew S. W., to Lockheed Corporation. Control force generator. 4,682,746, Cl. 244-207.000.

Thomas & Betts Corporation: *See*—
Noorily, Peter; and Slachetka, Joseph P., 4,682,836, Cl. 439-426.000.

Thomas, Bradley S.; and Kargetta, David J., to General Electric Company. Quadruple gripper. 4,682,806, Cl. 294-88.000.

Thomas, Mammen; and Weinberg, Matthew, to Advanced Micro Devices, Inc. Fast bipolar transistor for integrated circuit structure and method for forming same. 4,682,409, Cl. 29-591.000.

Thomas, Stephen M.; and Nitowski, Ronald, to Siemon Company, The. Eight conductor modular plug. 4,682,837, Cl. 439-344.000.

Thompson, Dale G.: *See*—
Melton, Carl W.; Thompson, Dale G.; Vassamillet, Larry F.; and Wickersham, Charles E., 4,683,043, Cl. 204-192.150.

Thomson, Robert G., to GTE Communication Systems Corporation. Impedance maintenance circuit for telephone interface. 4,683,351, Cl. 379-398.000.

Thorsgard, Knute E. Method and device for achieving reversible male sterilization. 4,682,592, Cl. 128-303.00R.

Thottathil, Paulose P.: *See*—
Horowitz, Carl; Ryan, John M.; Sanduja, Mohan L.; Sugathan, Kenneth K.; and Thottathil, Paulose P., 4,683,007, Cl. 106-308.00M.

Thyssen Industrie AG: *See*—
Kreiskorte, Ing. H., 4,682,498, Cl. 73-618.000.

Tietjen, Donald L.; and Cruess, Michael W., to Motorola, Inc. Method and apparatus for interfacing buses of different sizes. 4,683,534, Cl. 364-200.000.

Tieze, Jeffrey E.: *See*—
Fohr, Robert D.; and Tieze, Jeffrey E., 4,682,813, Cl. 297-192.000.

Tiffany, James J., to Newell Co. Display product and package combination. 4,682,690, Cl. 206-305.000.

Timeback Systems, Inc.: *See*—
Nelson, Robert G., 4,683,456, Cl. 340-347.0AD.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Kato, Masayuki; Taguchi, Yoshio; Imai, Chihiro; and Makishima, Tokuo, deceased, 4,683,275, Cl. 526-262.000.

Todd, Christian A.; and Hart, William D., to Storage Technology Corporation. Fluid filter system with replaceable filter element. 4,682,993, Cl. 55-314.000.

Toeg, Sasson: *See*—
Cook, Robert C.; and Toeg, Sasson, 4,682,801, Cl. 292-251.500.

Togino, Takayosi; Kobayashi, Yuki; and Yonekubo, Ken, to Olympus Optical Co., Ltd. Objective lens for microscope. 4,682,859, Cl. 350-414.000.

Tokizane, Masaru: *See*—
Kojima, Teiryo; Matsuda, Heiichiro; and Tokizane, Masaru, 4,682,465, Cl. 57-247.000.

Tokuda, Wahei; and Takagi, Atushi, to Canon Kabushiki Kaisha. Image recording apparatus. 4,682,882, Cl. 355-14.00D.

Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, to Rengo Co., Ltd. Apparatus for automatically mounting a web roll on a mill roll stand. 4,682,743, Cl. 242-58.600.

Tokyo Electric Co., Ltd.: *See*—
Horiya, Keiichi; Takahama, Kazuhide; and Usami, Yutaka, 4,683,479, Cl. 346-76.0PH.
Yamamoto, Mikio, 4,683,536, Cl. 364-408.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Goto, Sumio; Ishibashi, Jiro; and Nemoto, Masakazu, 4,682,554, Cl. 112-262.100.

Toldi, George; Nigam, Anil; Crain, Ronald; and Mercurio, Dominic, to Syquest Technology. Disc drive arrangement for a hard disc cartridge with a read/write head retract mechanism. 4,683,506, Cl. 360-105.000.

Tolonen, Eric; Tubbe, Clifford J.; Giesbrecht, George G.; and Wiens, John A., to Uniroyal Goodrich Tire Company, The. Early progressive junction extrusion process and system. 4,683,095, Cl. 264-171.000.

Tom, Victor T., to Analytic Sciences Corporation, The. System for and method of enhancing images using multiband information. 4,683,496, Cl. 358-166.000.

Toman, George M., to Meistergram, Inc. Multi-emblem clamping device. 4,682,551, Cl. 112-103.000.

Tomes, Herbert, Jr. Wire identifying sleeve applicator. 4,682,411, Cl. 29-745.000.

Tomida, Yoshinori: *See*—
Saito, Kenji; Eguchi, Ken; Kawada, Haruki; Tomida, Yoshinori; Nishimura, Yukuo; and Nakagiri, Takashi, 4,682,897, Cl. 374-45.000.

Tomita, Seisuke: *See*—
Kakiuchi, Shinichi; Saito, Tasuku; and Tomita, Seisuke, 4,683,257, Cl. 524-432.000.

Tonegawa, Tadashi: *See*—
Ohashi, Kunio; Tonegawa, Tadashi; Nagata, Shoichi; and Nakamura, Masatsugu, 4,683,186, Cl. 430-84.000.

Topich, James A.: *See*—
Lockwood, George C.; Topich, James A.; Turi, Raymond A.; and Maggard, George H., 4,683,554, Cl. 365-185.000.

Topper, Robert J., to RCA Corporation. Compatible wide-screen television system camera. 4,683,498, Cl. 358-209.000.

Toray Industries, Inc.: *See*—
Hagiwara, Satoru; Satoh, Kimio; and Okabe, Kazuo, 4,683,093, Cl. 264-22.000.
Kojima, Teiryo; Matsuda, Heiichiro; and Tokizane, Masaru, 4,682,465, Cl. 57-247.000.

Toray Silicone Co., Ltd.: *See*—
Mikami, Ryuzo, 4,683,250, Cl. 522-33.000.
Mikami, Ryuzo, 4,683,251, Cl. 522-46.000.
Suzuki, Toshio, 4,683,278, Cl. 528-32.000.
Yoshitake, Makoto; and Kishimoto, Keiichi, 4,683,319, Cl. 556-425.000.

Torigoe, Makoto, to Canon Kabushiki Kaisha. Illumination apparatus. 4,682,885, Cl. 355-67.000.

Toro Company, The: *See*—
Walto, Joseph J., 4,682,732, Cl. 239-123.000.

Torre, John J., to Allied Corporation. Inductive magnetic field generator. 4,683,461, Cl. 340-551.000.

Toshiba Ceramics Co., Ltd.: *See*—
Watanabe, Kuniaki; and Suzuki, Hideo, 4,682,718, Cl. 222-591.000.

Tossutto, Jean F.; and Bricaud, Herve , to Socapex. Integrated circuit test clip. 4,683,425, Cl. 324-158.00F.

Tote-Cart Company: *See*—
Mills, Frank, 4,682,782, Cl. 280-33.99B.

Toyama, Masamichi; Kaneda, Naoya; and Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Distance measuring device. 4,682,886, Cl. 356-1.000.

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Ishikawa, Hidehiko; Matsuura, Kazuo; and Misaki, Hideo, 4,683,198, Cl. 435-22.000.

Toyo Seikan Kaisha Ltd.: *See*—
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,683,263, Cl. 525-57.000.

Toyoshima, Masakatsu: *See*—
Sakamoto, Akira; Fukami, Takeshi; Sugita, Takehiro; and Toyoshima, Masakatsu, 4,683,586, Cl. 380-48.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hoshino, Shigeru; and Miyata, Hiroshi, 4,683,375, Cl. 250-231.0SE.
Kato, Kenji; Inoue, Tokuta; Nakanishi, Kiyoshi; and Matsushita, Soichi, 4,682,577, Cl. 123-492.000.
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.
Kurosu, Noriaki; Ohmae, Masanori; and Kashiwa, Michiaki, 4,683,540, Cl. 364-468.000.
Murata, Kiyohito, 4,682,676, Cl. 192-21.500.
Okada, Mitsuhiko; and Ito, Hiroshi, 4,682,519, Cl. 74-868.000.
Sumiya, Koji; Kano, Takenori; Kubo, Seitoku; and Watanabe, Kazuaki, 4,682,534, Cl. 92-130.00R.
Takada, Mitsuru; Itoh, Hiroshi; Hiramatsu, Shigeki; and Tamura, Tadashi, 4,682,518, Cl. 74-867.000.

Tracy, C. Edwin: *See*—
Benson, David K.; and Tracy, C. Edwin, 4,683,154, Cl. 428-34.000.

Trautwein, Richard R.: *See*—
Wagner, Edward D.; and Trautwein, Richard R., 4,683,418, Cl. 324-61.00P.

Tremper, Donald: *See*—
Figiel, Janusz; Tremper, Donald; and Lems, Peter, 4,683,017, Cl. 156-73.100.

Trent Jetfloor Limited: *See*—
Sparrow, Ian H., 4,682,458, Cl. 52-309.800.

Tri Plas, Inc.: *See*—
DeVore, Frank C.; and Argudo, Marcos A., 4,682,706, Cl. 220-276.000.

Trivedi, Bharat K., to Warner-Lambert Company. N_6-Benzopyrano- and benzothiopyrano adenosines and methods of use. 4,683,223, Cl. 514-46.000.

Trom, Joseph, Jr.: *See*—
Feight, Robert A.; Jaqua, Vance W.; and Trom, Joseph, Jr., 4,682,779, Cl. 277-34.300.

Troxel, Kathleen A.: *See*—
Kammann, Karl P., Jr.; and Troxel, Kathleen A., 4,683,081, Cl. 252-392.000.

Trujillo, Victor D.: *See*—
Ferchau, Joerg U.; and Trujillo, Victor D., 4,682,833, Cl. 439-377.000.

Trus Joist Corporation: *See*—
Reetz, William R., 4,682,460, Cl. 52-632.000.

Truskalo, Walter; and Nolan, Thomas F., to RCA Corporation. Parabolic voltage generating apparatus for television. 4,683,405, Cl. 315-371.000.

TRW Inc.: *See*—
Palmer, William B.; and Fink, Henry, 4,682,804, Cl. 294-82.260.

Tsang, Wen-Ghih, to Damon Biotech, Inc. Capsule loading technique. 4,683,092, Cl. 264-4.300.

Tschopp, Werner, to Spectrospin AG. Method for homogenizing the field of a magnetic coil and apparatus therefor. 4,683,434, Cl. 324-320.000.

Tse, Samuel W.; and Galloway, Deane E., to American Can Company. Nylon copolymer and nylon blends and films made therefrom. 4,683,170, Cl. 428-349.000.

Tsuji, Shintaro: *See*—
Umeda, Yasukazu; and Tsuji, Shintaro, 4,682,673, Cl. 187-126.000.

Tsukada, Toshihisa: *See*—
Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki; Umemoto, Yasunari; and Tsukada, Toshihisa, 4,683,487, Cl. 357-34.000.

Tsunakawa, Mitsuaki; Konishi, Masataka; and Miyaki, Takeo, to Bristol-Myers Company. BMY-28121, a new antitumor antibiotic. 4,683,230, Cl. 314-214.000.

Tsunekawa, Tokuichi: *See*—
Ohmura, Hiroshi; Tsunekawa, Tokuichi; Kiyohara, Shyuichi; and Kawabata, Takashi, 4,682,873, Cl. 354-478.000.

Tubbe, Clifford J.: *See*—
Tolonen, Eric; Tubbe, Clifford J.; Giesbrecht, George G.; and Wiens, John A., 4,683,095, Cl. 264-171.000.

Tufty, Lyle R.: *See*—
Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., 4,683,505, Cl. 360-98.000.

Tunzini Nessi Entreprises d'Equipements: *See*—
Huard, Jean-Francois, 4,682,472, Cl. 62-3.000.

Tupman, David J., to Caterpillar Industrial Inc. Optical seat switch. 4,683,373, Cl. 250-221.000.

Turbo Tek Enterprises, Inc.: *See*—
Proctor, Rudy R.; and Reinstein, Fred M., 4,682,734, Cl. 239-315.000.

Turi, Raymond A.: *See*—
Lockwood, George C.; Topich, James A.; Turi, Raymond A.; and Maggard, George H., 4,683,554, Cl. 365-185.000.

Turnbull, William E. Appliance for purifying water. 4,683,054, Cl. 210-91.000.

Turner, Clarence C., to Ford Meter Box Company, Inc., The. Self-drilling valve. 4,682,624, Cl. 137-318.000.

Turner, Herman E., Jr.; and Glowacki, Robert D., to Nordson Corporation. Multi-station viscous liquid distribution system. 4,682,710, Cl. 222-63.000.

Tuss, John J.; and Donaldson, Robert D., to Warner & Swasey Company, The. Coordinate measuring machine. 4,682,418, Cl. 33-1.00M.

Twardowski, Zbigniew; and McGilvery, James D., to Tenneco Canada Inc. (ERCO division). Membrane pervaporation process. 4,683,039, Cl. 204-95.000.

Uda, Kazutaka, to Sharp Kabushiki Kaisha. Pressure sensitive element. 4,682,500, Cl. 73-705.000.

Ueda, Kouzou; Nagumo, Daisuke; Shuto, Hirotetsu; and Kuriyama, Hiroaki, to Kyokuto Kaihatsu Kogyo Co., Ltd. Articulated belt conveyor. 4,682,686, Cl. 198-844.000.

Ueda, Yasutsugu; and Roberge, Guy, to Bristol-Myers Company. Carbapenem intermediates. 4,683,296, Cl. 539-558.000.

Ueda, Yuji: *See*—
Minai, Masayoshi; and Ueda, Yuji, 4,683,323, Cl. 558-52.000.

Uejima, Tamotu: *See*—
Itoh, Hiroshi; Nakagawa, Toshimi; Nitta, Atsuhiko; Tanaka, Tomio; Kamio, Hideo; Enoshita, Ryosuke; Uejima, Tamotu; Ouchi, Takahiro; Abe, Kazuki; and Kobayashi, Sadao, 4,683,258, Cl. 524-434.000.

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Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,683,263, Cl. 525-57.000.

Ueno, Masato, to Kyocera Kabushiki Kaisha. Mold for use in dental precision casting. 4,682,644, Cl. 164-359.000.

Ueno, Shinji; and Koga, Naoki. Method of generating oxygen for emergency use. 4,683,130, Cl. 423-579.000.

Uerdingen, Walter: *See*—
Lindner, Christian; Brudermanns, Karola; Waniczek, Helmut; Uerdingen, Walter; and Hurnik, Helmut, 4,683,267, Cl. 525-133.000.

Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki; Umemoto, Yasunari; and Tsukada, Toshihisa, to Hitachi, Ltd. Heterojunction bipolar transistor. 4,683,487, Cl. 357-34.000.

Uezu, Kazuo: *See*—
Suzaki, Masayuki; Nishiwaki, Shoji; Hayashima, Toshitaka; Uezu, Kazuo; Maehara, Hidejirou; and Momose, Masanori, 4,683,478, Cl. 346-76.0PH.

Uffenheimer, Kenneth F., to Technicon Instruments Corporation. Random access single channel sheath stream apparatus. 4,683,212, Cl. 436-52.000.

Ukachi, Takashi; Bessho, Keiichi; Kumano, Atsushi; Matsumura, Yoshio; and Ansel, Robert E., to DeSoto, Inc.; and Japan Synthetic Rubber Co., Ltd. Radiation curable composition. 4,683,280, Cl. 528-71.000.

Ullman, Myron E.: *See*—
Kessler, Ronald N.; and Ullman, Myron E., 4,682,704, Cl. 215-329.000.

Umeda, Yasukazu; and Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,682,673, Cl. 187-126.000.

Umemoto, Yasunari: *See*—
Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki; Umemoto, Yasunari; and Tsukada, Toshihisa, 4,683,487, Cl. 357-34.000.

Union Carbide Corporation: *See*—
Goddard, Errol D., 4,683,004, Cl. 106-170.000.
Koleske, Joseph V.; and Domeier, Linda A., 4,683,287, Cl. 528-357.000.
Lok, Brent M.; Vail, Lawrence D.; and Flanigen, Edith M., 4,683,217, Cl. 502-214.000.

Union Oil Company of California: *See*—
Ward, John W., 4,683,050, Cl. 208-110.000.
Young, Donald C., 4,682,999, Cl. 71-28.000.

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Tolonen, Eric; Tubbe, Clifford J.; Giesbrecht, George G.; and Wiens, John A., 4,683,095, Cl. 264-171.000.

United Aircraft Products, Inc.: *See*—
Rodgers, James E., 4,682,920, Cl. 409-231.000.

United Kingdom Atomic Energy Authority: *See*—
Humphries, John; and Morrison, Neil S., 4,683,056, Cl. 210-186.000.

United States of America
Air Force: *See*—
Jones, Franklin B.; Milberger, Walter E.; and Kerfoot, Charles S., 4,683,387, Cl. 307-571.000.
Lindley, Patricia M.; Reinhardt, Bruce A.; and Arnold, Fred E., 4,683,340, Cl. 568-331.000.
Randig, George W., 4,683,474, Cl. 342-368.000.
Unroe, Marilyn R.; Reinhardt, Bruce A.; and Arnold, Fred E., 4,683,309, Cl. 544-353.000.
Young, James P.; Weber, Robert J.; and Kaelin, G. Robert, 4,683,443, Cl. 330-277.000.
Energy: *See*—
Benson, David K.; and Tracy, C. Edwin, 4,683,154, Cl. 428-34.000.
Knapp, Furn F., Jr.; Butler, Thomas A.; and Brihaye, Claude, 4,683,123, Cl. 423-2.000.
Muscatello, Anthony C.; Navratil, James D.; and Saba, Mark T., 4,683,124, Cl. 423-6.000.
Scott, Charles D., 4,683,042, Cl. 204-180.100.
National Aeronautics and Space Administration: *See*—
Acres, William R., 4,682,745, Cl. 244-161.000.
National Aeronautics & Space Administration: *See*—
Reed, Wilmer H., 4,682,494, Cl. 73-147.000.
Navy: *See*—
Cowen, Steven J., 4,682,846, Cl. 350-96.180.
Luborsky, Fred; and Lee, Daeyong, 4,682,486, Cl. 72-148.000.
Wilger, John F.; Orillo, Stephen, Jr.; and Nakano, Gregory S., 4,682,631, Cl. 138-94.000.

U.S. Philips Corporation: *See*—
Baggen, Constant P. M. J.; Driessen, Leonardus M. H. E.; Pollen, Rudy W. J.; and Vries, Lodewijk B., 4,683,572, Cl. 371-37.000.
Bierhoff, Martinus P. M.; and Lonij, Hubertus M. M., 4,683,561, Cl. 369-45.000.
Brock, Thorsten, 4,683,495, Cl. 358-148.000.
Broer, Dirk J.; Zwiers, Renso J. M.; and Jochem, Cornelis M. G., 4,682,853, Cl. 350-128.000.
Clasen, Rolf, 4,682,995, Cl. 65-18.100.
Jarry, Philippe; Haji, Mohamed L.; Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,683,163, Cl. 428-209.000.
Moore, Paul A., 4,683,414, Cl. 320-13.000.
Vriens, Leendert; Clark, John A.; and Spruit, Johannes H. M., 4,683,398, Cl. 313-474.000.

U.S. Precision Lens Incorporated: *See*—
Moskovich, Jacob, 4,682,862, Cl. 350-432.000.

U.S. Product Development Company: *See*—
Adell, Robert, 4,682,415, Cl. 29-846.000.
Adell, Robert, 4,682,442, Cl. 49-462.000.

Universite de Rennes I: *See*—
De Burgat, Michel; Le Traon, Andre ; Pilet, Jean-Claude; and Sharaiha, Ammar, 4,683,417, Cl. 324-60.00C.

University of California, The Regents of the: *See*—
Fymat, Alain L.; Lee, Wai-Nang P.; and Greenfield, Moses A., 4,682,604, Cl. 128-659.000.

University of Delaware: *See*—
Barnett, Allen M., 4,682,406, Cl. 29-572.000.

Unroe, Marilyn R.; Reinhardt, Bruce A.; and Arnold, Fred E., to United States of America, Air Force. Phenylquinoxaline resin monomers. 4,683,309, Cl. 544-353.000.

Upjohn Company, The: *See*—
Aristoff, Paul A., 4,683,330, Cl. 560-51.000.

Upmeier, Hartmut; and Peters, Rudolf, to Windmoller & Holscher. Flattening and take-off apparatus for providing a plastic film web from a blown tubular film. 4,682,941, Cl. 425-72.00R.

Uragami, Akira: *See*—
Shibata, Manabu; and Uragami, Akira, 4,683,384, Cl. 307-475.000.

Urata, Keiji; and Kurome, Yoshio, to Sanyo-Kokusaku Pulp Co., Ltd. Hardenable coating composition for polypropylene resins. 4,683,264, Cl. 525-65.000.

Urban, Manfred, to Robert Bosch GmbH. Method of monitoring computer elements, particularly microprocessors. 4,683,568, Cl. 371-12.000.

Urfer, Allen D.: *See*—
Malik, Arshad H.; and Urfer, Allen D., 4,683,074, Cl. 252-136.000.

Usagawa, Toshiyuki: *See*—
Ueyanagi, Kiichi; Takahashi, Susumu; Usagawa, Toshiyuki; Umemoto, Yasunari; and Tsukada, Toshihisa, 4,683,487, Cl. 357-34.000.

Usami, Yutaka: *See*—
Horiya, Keiichi; Takahama, Kazuhide; and Usami, Yutaka, 4,683,479, Cl. 346-76.0PH.

USM Corporation: *See*—
Herdeg, Donald F.; and Ciccia, Lawrence P., 4,682,552, Cl. 112-121.120.
Shields, Thomas A., 4,682,925, Cl. 411-461.000.

Uttke, Russell H. C.: *See*—
Leege, James W.; Stacey, Robert E.; and Uttke, Russell H. C., 4,682,687, Cl. 198-852.000.

Vachet, Andre J.: *See*—
Goepfert, Serge P. P.; Renault, Serge A. M.; Roger, Francoise M. M.; Themont, Jean-Pierre; and Vachet, Andre J., 4,683,153, Cl. 428-1.000.

Vail, Lawrence D.: *See*—
Lok, Brent M.; Vail, Lawrence D.; and Flanigen, Edith M., 4,683,217, Cl. 502-214.000.

Vaillancourt, Marilyn L. Convertible pierced-earlobe earring. 4,682,477, Cl. 63-12.000.

Vaillancourt, Vincent L.; and Kocanowski, Stephen, to VLV Associates. Wire guide. 4,682,607, Cl. 128-772.000.

Valeo: *See*—
Potier, Michel, 4,682,650, Cl. 165-173.000.

Valmet Oy: *See*—
Pitkajarvi, Kari, 4,683,027, Cl. 162-199.000.

Vanaschen, Luc: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schwarzenberg, Norbert; Radermacher, Herbert; Blank, Kurt; Audi, Josef; and Vanaschen, Luc, 4,682,997, Cl. 65-106.000.

Vancura, Vladimir. Drill adapter. 4,682,662, Cl. 175-320.000.

Van der Burgt, Maarten J.: *See*—
Goudriaan, Johan C.; and Van der Burgt, Maarten J., 4,683,121, Cl. 422-197.000.

Van DerLinden, Roy E.: *See*—
Francis, John H.; and Van DerLinden, Roy E., 4,682,517, Cl. 74-796.000.

Vandesteeg, Gregg A.: *See*—
Ronning, Patricia M.; and Vandesteeg, Gregg A., 4,683,132, Cl. 424-409.000.

van Dongen, Johannes C. M.; and Maekiaho, Leo B., to Shell Oil Company. Method for determining the azimuth of a borehole. 4,682,421, Cl. 33-302.000.

Van Duyne, Giles, Jr.: *See*—
Hogshead, Rodney C., III; and Van Duyne, Giles, Jr., 4,682,642, Cl. 160-392.000.

Van Geenen, Albert A.; and Bongers, Jozef J. M., to Stamicarbon B.V. Process for preparing an acyl-lactam compound. 4,683,304, Cl. 540-529.000.

Vanhille, Andre A. F. L., to Sobemi N.V. Method of forming a cylindrical sleeve. 4,682,485, Cl. 72-133.000.

Van Oort, Aart B.: *See*—
Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., 4,683,338, Cl. 568-12.000.

Van Wijnendaele, Frans; Gilles, Daniel; and Simonet, Guy, to Smith Kline RIT, S.A. Process for the extraction and purification of proteins from culture media producing them. 4,683,294, Cl. 530-371.000.

Varker, Charles J.: *See*—
Wilson, Syd R.; Gregory, Richard B.; and Varker, Charles J., 4,682,407, Cl. 29-576.00B.

Vartanian, Albert V.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Strebkov, Dmitry S.; and Ryabikov, Stanislav V., 4,682,841, Cl. 350-3.700.

Vas-Cath of Canada Limited: *See*—
Martin, Geoffrey S., 4,682,978, Cl. 604-43.000.

Vassamillet, Larry F.: *See*—
Melton, Carl W.; Thompson, Dale G.; Vassamillet, Larry F.; and Wickersham, Charles E., 4,683,043, Cl. 204-192.150.

Vassort, Guy: *See*—
Armand, Michel; Chabagno, Jean-Michel; Ricoux, Philippe; Vassort, Guy; Gauthier, Michel; Brochu, Fernand; and Rigaud, Philippe, 4,683,181, Cl. 429-192.000.

Vaughan, A. Dahlgren: *See*—
White, John S.; Vaughan, A. Dahlgren; and Akers, Francis I., 4,682,850, Cl. 350-96.230.

Vecchietti, Vittorio: *See*—
Ferrari, Giorgio; and Vecchietti, Vittorio, 4,683,245, Cl. 514-652.000.

Velencei, John. Internal combustion engine (JV-1). 4,682,570, Cl. 123-73.0PP.

Vernon and Company (Pulp Products) Limited: *See*—
Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; Mason, Margaret, executor; and Shindler, Geoffrey A., executor, 4,683,028, Cl. 162-275.000.

Verrier, Pierre E.: *See*—
Hanin, Jean A.; and Verrier, Pierre E., 4,683,343, Cl. 568-594.000.

Verrijp, Bastiaan: *See*—
Hazenbroek, Jacobus E.; Verrijp, Bastiaan; and Wallbridge, William L., 4,682,386, Cl. 17-46.000.

Vianova Kunstharz, A.G.: *See*—
Paar, Willibald; and Honig, Helmut, 4,683,285, Cl. 528-113.000.

Victor Company of Japan, Ltd.: *See*—
Yamagishi, Tooru, 4,683,571, Cl. 371-37.000.

Victor Stanley, Inc.: *See*—
Skalka, Gerald P., 4,682,772, Cl. 272-113.000.

Viertel, Lothar; and Kaiser, Klaus-Peter, to Gebr. Happich GmbH. Sun visor for vehicles. 4,683,522, Cl. 362-135.000.

Vipont Laboratories, Inc.: *See*—
Southard, G. Lee, 4,683,133, Cl. 424-49.000.

Vitamins, Inc.: *See*—
Rice, Wayne K., 4,683,063, Cl. 210-634.000.

Vitro Tec Fideicomiso: *See*—
Ayala-Ortiz, Ignacio L., 4,682,998, Cl. 65-164.000.

VLV Associates: *See*—
Vaillancourt, Vincent L.; and Kocanowski, Stephen, 4,682,607, Cl. 128-772.000.

Voest-Alpine: *See*—
Hulek, Anton, 4,682,646, Cl. 164-481.000.

Vogt, Gert: *See*—
Wiedenhoff, Wolfgang; Gaertner, Adolf W.; Vogt, Gert; and Weisgerber, Claus, 4,682,632, Cl. 138-178.000.

Vogt, Hans: *See*—
Hurten, Oskar; Vogt, Hans; and Stutenkemper, Paul, 4,682,812, Cl. 296-195.000.

Vojtisek, Vladimir: *See*—
Krovak, Premysl; Behunek, Vladimir; Vojtisek, Vladimir; Salvet, Miroslav; and Hasal, Pavel, 4,683,062, Cl. 210-617.000.

Volk, David. Head-borne binocular indirect ophthalmoscope with integrated telescope. 4,682,866, Cl. 351-205.000.

Vollmer, David J.; and Greame, James E., to Automatic Switch Company. Solenoid actuator with fastener. 4,683,453, Cl. 335-255.000.

Vollmer, David J.; and Greame, James E., to Automatic Switch Company. Solenoid actuator with electrical connection modules. 4,683,454, Cl. 335-299.000.

Voss, Steven H.: *See*—
Schmidt, Laurence J.; Severson, Randall L.; Tufty, Lyle R.; and Voss, Steven H., 4,683,505, Cl. 360-98.000.

Vriens, Leendert; Clark, John A.; and Spruit, Johannes H. M., to U.S. Philips Corporation. Projection television display tube and device having interference filter. 4,683,398, Cl. 313-474.000.

Vries, Lodewijk B.: *See*—
Baggen, Constant P. M. J.; Driessen, Leonardus M. H. E.; Pollen, Rudy W. J.; and Vries, Lodewijk B., 4,683,572, Cl. 371-37.000.

Vyne, Robert L., to Motorola, Inc. Operational amplifier circuit utilizing resistors trimmed by metal migration. 4,683,442, Cl. 330-261.000.

W. H. Brady Co.: *See*—
Maser, Thomas L., 4,683,360, Cl. 200-314.000.

W. M. Still & Sons Limited: *See*—
Snowball, Malcolm R.; and Hayes, Cecil, 4,682,537, Cl. 99-282.000.

W. Schlafhorst & Co.: *See*—
Derichs, Josef, 4,682,636, Cl. 139-435.000.

Waarvik, Thomas L., to Eli Lilly and Company. Culture monitoring system. 4,683,207, Cl. 435-311.000.

Waco Pure Chemical Ind. Inc.: *See*—
Tanaka, Motoaki; Ogawa, Yasuaki; Miyagawa, Tsutomu; and Watanabe, Toshio, 4,683,288, Cl. 528-361.000.

Wada, Yoshiomi. Educational toy. 4,682,955, Cl. 434-191.000.

Wagberg, Michael L.: *See*—
Scobie, William B.; and Wagberg, Michael L., 4,682,758, Cl. 251-84.000.

Wagers, Kevin J., to Dow Chemical Company, The. Method of forming flexible fastener elements and securing them to a traveling web. 4,683,015, Cl. 156-66.000.

Wagner, Edward D.; and Trautwein, Richard R., to Wagner Electronic Products, Inc. Moisture measuring method and apparatus. 4,683,418, Cl. 324-61.00P.

Wagner Electronic Products, Inc.: *See*—
Wagner, Edward D.; and Trautwein, Richard R., 4,683,418, Cl. 324-61.00P.

Wagner Spray Tech Corporation: *See*—
Petersen, Walter J.; and Svendsen, John M., 4,683,370, Cl. 219-370.000.

Wagner, William R., to Rockwell International Corporation. Turbocompressor downhole steam-generating system. 4,682,471, Cl. 60-649.000.

Wagner, William R., to Rockwell International Corporation. Labyrinthine turbine-rotor-blade tip seal. 4,682,933, Cl. 415-172.00A.

Wakamatsu, Saburo: *See*—
Honda, Tatsutoku; Endo, Michiyuki; Wakamatsu, Saburo; and Kudo, Yoshio, 4,682,855, Cl. 350-276.00R.

Walker, Bryan J., to 501 Granulite Limited. Building materials. 4,683,006, Cl. 106-288.00R.

Walker, Charles E.: *See*—
Kea, Sandra; Walker, Charles E.; and Kline, Eric, 4,683,299, Cl. 536-119.000.

Walker, Thomas. Temperature compensated Bourdon tube gauge. 4,682,501, Cl. 73-708.000.

Walker, Timothy A.: *See*—
Elsmore, Jeff; Stoorza, Kenneth W.; and Walker, Timothy A., 4,683,469, Cl. 340-723.000.

Wallace, Richard E.: *See*—
Rouse, David M.; Wallace, Richard E.; and Zelms, Charles M., 4,683,563, Cl. 370-16.000.

Wallat, Siegfried: *See*—
Moeller, Hinrich; and Wallat, Siegfried, 4,683,244, Cl. 514-568.000.

Wallbridge, William L.: *See*—
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Waller, Martin; Farrell, Geoffrey; Mills, Kenneth W., deceased; by Mason, Margaret, executor; and by Shindler, Geoffrey A., executor, to Vernon and Company (Pulp Products) Limited. Moulding. 4,683,028, Cl. 162-275.000.

Waltemyer, Ronald G.; and Brown, Royce L., to Cooper Industries, Inc. Chain forming method and apparatus. 4,682,467, Cl. 59-30.000.

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Ferraro, Frank A., 4,683,096, Cl. 264-249.000.
Glass, Michael; Hoholick, Joseph; and Orlandi, Daniel A., 4,683,138, Cl. 426-5.000.
Trivedi, Bharat K., 4,683,223, Cl. 514-46.000.

Warner & Swasey Company, The: *See*—
Tuss, John J.; and Donaldson, Robert D., 4,682,418, Cl. 33-1.00M.

Warrin, George E., to Dentsply Research & Development Corp. Tool holder for ultrasonic endodontic apparatus. 4,682,949, Cl. 433-81.000.

Washington, Leo. Stick and hoop toy. 4,682,971, Cl. 446-450.000.

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Hirohashi, Setsuo; Shimosato, Yukio; and Watanabe, Masahiko, 4,683,200, Cl. 435-68.000.

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Water Equipment Services, Inc.: *See*—
DeLoach, Anthony, 4,682,613, Cl. 134-58.00R.

Waters, Charles M. Flexible blanket. 4,683,156, Cl. 428-52.000.

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Weaver, Robert J.; Young, Ronald F.; and Crockett, Dennis D., to Lincoln Electric Company, The. High penetration, high speed, agglomerated welding flux. 4,683,011, Cl. 148-26.000.

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Pidgeon, Alastair N.; and Webb, Arthur L., 4,683,348, Cl. 136-246.000.

Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst. Method for carbonizing cold-compacted briquettes. 4,683,030, Cl. 201-6.000.

Weber, Kent, to Sundstrand Corporation. Pressure regulating valve. 4,682,622, Cl. 137-154.000.

Weber, Richard M., to Texas Instruments Incorporated. Transportable hydraulic seismic transducer. 4,682,669, Cl. 181-114.000.

Weber, Robert J.: *See*—
Young, James P.; Weber, Robert J.; and Kaelin, G. Robert, 4,683,443, Cl. 330-277.000.

Weber, Victor. Reflective sheeting technology. 4,682,852, Cl. 350-105.000.

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Tammisalo, Erkki; Kanerva, Heikki; Aarnio, Jaakko; Wederhorn, Markku; and Laner, Kai, 4,683,581, Cl. 378-38.000.

Wehr Corporation: *See*—
Cutright, Robert A.; Briggs, Mark W.; and Bouwman, George J., 4,683,424, Cl. 324-158.00F.

Weigle, William O.; Hobbs, Monte O.; Morgan, Edward L.; Thoman, Marilyn L.; and Houghten, Richard A., to Scripps Clinic and Research Foundation. Lymphocyte-activating polypeptides. 4,683,221, Cl. 514-14.000.

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Thomas, Mammen; and Weinberg, Matthew, 4,682,409, Cl. 29-591.000.

Weise, Lutz: *See*—
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Weisgerber, Claus: *See*—
Wiedenhoff, Wolfgang; Gaertner, Adolf W.; Vogt, Gert; and Weisgerber, Claus, 4,682,632, Cl. 138-178.000.

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Wells, Sharon K.: *See*—
Holy, Stephen M., 4,682,774, Cl. 273-84.00R.

Wells, Thomas J.; and Serafini, Angelo, to Leggett & Platt, Incorporated. Bedding and seating product having double twist coil spring and method and apparatus for manufacturing the same. 4,682,394, Cl. 29-173.000.

Welner, Jerome M., to Hughes Aircraft Company. Spectral analyzer and direction indicator. 4,682,888, Cl. 356-73.000.

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Gastrock, William H.; and Wepplo, Peter J., 4,683,324, Cl. 558-354.000.

Werle, Peter; Focke, Holger; and Boes, Alwin, to Degussa Aktiengesellschaft. Process for the preparation of dodecamethylenebismelamine. 4,683,307, Cl. 544-198.000.

Werner, Hans U., to S. Franzen Sohne GmbH & Co. KG. Permutation lock. 4,682,483, Cl. 70-312.000.

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Stiller, Alfred H.; and Smith, James E., 4,682,569, Cl. 123-55.00A.

Western Gear Corporation: *See*—
Brown, James R.; Lane, Gary S.; and Larson, Wallace H., 4,682,530, Cl. 89-1.550.

Westerwaelder Eisenwerk Gerhard GmbH: *See*—
Gerhard, Helmut, 4,682,923, Cl. 410-90.000.

Westinghouse Electric Corp.: *See*—
Balog, Leonard J., 4,683,108, Cl. 376-260.000.
Bialek, Edward J.; and Anticich, Leslie B., 4,683,412, Cl. 318-798.000.
Carlson, William R.; Gjertsen, Robert K.; and Miller, John V., 4,683,117, Cl. 376-449.000.
Cooper, Frank W., Jr.; and Dailey, George F., 4,683,109, Cl. 376-261.000.
Driggers, John M., 4,683,361, Cl. 219-10.430.
Ferrari, Harry M.; and Wilson, John F., 4,683,116, Cl. 376-447.000.
Goutzoulis, Anastasios P., 4,683,420, Cl. 324-73.00R.
Grunert, Kurt A.; and Maier, Alfred E., 4,683,451, Cl. 335-174.000.
Hager, Robert E., 4,683,105, Cl. 376-259.000.
Ho, Shih-Ming; and Radford, Kenneth C., 4,683,114, Cl. 376-419.000.
Kasner, William H.; Cooper, Martin H.; Swenson, Clark E.; Ciez, Albert P.; and Andrews, Katherine M., 4,683,365, Cl. 219-121.0LC.
Lott, Randy G.; and Baloh, Frank J., 4,683,103, Cl. 376-209.000.
Miller, Robert C.; and Asars, Juris A., 4,683,421, Cl. 324-96.000.
Miller, Robert C., 4,683,513, Cl. 361-76.000.
Rosa, John, 4,683,527, Cl. 363-5.000.
Taft, Jeffrey D.; and Seymour, James O., Jr., 4,683,493, Cl. 358-101.000.
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Wetzel, Edgar: *See*—
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Whirlpool Corporation: *See*—
Janke, Donald E., 4,682,474, Cl. 62-187.000.

White, John S.; Vaughan, A. Dahlgren; and Akers, Francis I., to ITT Corporation. Optical fiber with single ultraviolet cured coating. 4,682,850, Cl. 350-96.230.

Whitten, Kathleen R.; Garbrecht, William L.; Marzoni, Gifford P.; and Parli, C. John, to Eli Lilly and Company. Cycloalkanol esters of dihydrolysergic acid useful as $5Ht_2$ receptor antagonists. 4,683,236, Cl. 514-288.000.

Whyzmuzis, Paul D.; and Menke, John M., to Henkel Corp. Non-dimer acidic polyamide from medium chain diacid having improved water solubility useful as flexographic/gravure ink binder. 4,683,262, Cl. 524-608.000.

Wickersham, Charles E.: *See*—
Melton, Carl W.; Thompson, Dale G.; Vassamillet, Larry F.; and Wickersham, Charles E., 4,683,043, Cl. 204-192.150.

Wickert, Frank A., to Glidden Company, The. Clear topcoat coatings for wood. 4,683,260, Cl. 524-512.000.

Wieck, Gregory J. Extractor irrigation wobble tube system. 4,682,736, Cl. 239-736.000.

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Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,683,238, Cl. 514-292.000.

Wiedenhoff, Wolfgang; Gaertner, Adolf W.; Vogt, Gert; and Weisgerber, Claus, to Mannesmann AG. Crack stopping in pipelines. 4,682,632, Cl. 138-178.000.

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Wienck, Dennis A.; and Mints, Danny K., to Halliburton Company. Automatic material sampler. 4,682,506, Cl. 73-863.540.

Wiens, John A.: *See*—
Tolonen, Eric; Tubbe, Clifford J.; Giesbrecht, George G.; and Wiens, John A., 4,683,095, Cl. 264-171.000.

Wiese, Heiner: *See—*
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Wife, Richard L.; Snel, Johannes J. M.; and Van Oort, Aart B., to Shell Oil Company. Process for the preparation of bis-phosphineoxide compounds. 4,683,338, Cl. 568-12.000.
Wilcox, Michael J.: *See—*
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Wiles, Keith E., to National Can Corporation. Container having a tamper proof lid. 4,682,707, Cl. 220-307.000.
Wilger, John F.; Orille, Stephen, Jr.; and Nakano, Gregory S., to United States of America, Navy. Sealing apparatus for a valve body opening. 4,682,631, Cl. 138-94.000.
Wm. T. Burnett & Co., Inc.: *See—*
Davis, Gregory B.; and Buchanan, Michael S., 4,683,246, Cl. 521-54.000.
Williams, A. Graves, III; and Thackston, Ronald L., to Irwin Company, The. Spade bit with fluted shoulders. 4,682,917, Cl. 408-212.000.
Williams, John A.: *See—*
Cooper, Graham H. B.; and Williams, John A., 4,682,627, Cl. 137-572.000.
Williams, Leonard E., Jr.: *See—*
Schnitzer, Emanuel; and Williams, Leonard E., Jr., 4,682,559, Cl. 114-295.000.
Williams, Warren R., Jr.: *See—*
Punako, Stephen; Gallusser, David O.; and Williams, Warren R., Jr., 4,682,832, Cl. 439-589.000.
Willis, Keith M.: *See—*
Willis, Wayne H.; and Willis, Keith M., 4,682,778, Cl. 273-257.000.
Willis, Mark E., to Mobil Oil Corporation. Method for identifying arrival times of waveforms on acoustic borehole well logs. 4,683,556, Cl. 367-27.000.
Willis, Mark E., to Mobil Oil Corporation. Acoustic logging method for identifying subsurface formation boundaries. 4,683,557, Cl. 367-57.000.
Willis, Wayne H.; and Willis, Keith M. Political game utilizing die with interchangeable faces. 4,682,778, Cl. 273-257.000.
Wilson, David P.; Pham, Hang T.; Lund, Earl A. E.; Basu, Rajat S.; and Pelava, John W., to Allied Corporation. Azeotrope-like compositions of trichlorotrifluoroethane, methanol, nitromethane, acetone, and methyl acetate. 4,683,075, Cl. 252-171.000.
Wilson, Edgar R.: *See—*
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Wilson, John F.: *See—*
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Wilson, Syd R.; Gregory, Richard B.; and Varker, Charles J., to Motorola, Inc. Means and method for stabilizing polycrystalline semiconductor layers. 4,682,407, Cl. 29-576.00B.
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Witczak, Stanley; and Gasner, Earl L., to AM International, Inc. Ink or moisture roller for duplicating machines. 4,682,543, Cl. 101-350.000.
Witiak, Donald T.; and Glaser, Ronald M., to Ohio State University Research Foundation, The. Anti-cancer agents and processes for their preparation. 4,683,087, Cl. 260-396.00R.
Wittke, Ernest C. Gear assisted continuously variable transmission. 4,682,511, Cl. 74-681.000.
Wohler, Johann F., to General Dynamics Land Systems, Inc. Active protection system. 4,682,528, Cl. 89-1.300.
Wojtanek, Guy A., to Eaton Corporation. Illuminated switch assembly with combined light and light shield. 4,683,359, Cl. 200-314.000.
Wolf, James A., Jr.: *See—*
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Hall, Leslie C., Jr.; Meyer, David L.; and Wolfe, Brian A., 4,682,391, Cl. 29-33.00M.
Wolff, Friedrich. Lamp for emission of radiation in UV and visible light ranges of the spectrum. 4,683,379, Cl. 250-493.100.
Wong, Hin-Wan: *See—*
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Wood, Chester W., to Dover Corporation. Nozzle construction and method of making the same. 4,682,714, Cl. 222-153.000.
Wood, John M. Golf swing training device. 4,682,775, Cl. 273-186.00A.
Wood, Thomas J. Board game. 4,682,777, Cl. 273-243.000.
Woodall, Bobbie L.; and Nuttall, Jerry H. Apparatus and method for seating carbon brushes in motors or the like. 4,682,446, Cl. 51-281.00R.
Woodley, George M.; and Bakes, William S., to King Instrument Corporation. Apparatus and method for loading tape into a cassette. 4,682,742, Cl. 242-56.00R.
Woodruff, Roger W.: *See—*
Green, Kenneth E.; Johnson, Donald K.; and Woodruff, Roger W., 4,682,568, Cl. 122-235.00C.
Woodward, Eldon D. Combination toy box-drafting table. 4,682,827, Cl. 312-231.000.
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Wu, Jiing-Liang; Scherbarth, David W.; and Marschik, David, to Westinghouse Electric Corp. Rotary switch for inductively driven rail gun systems. 4,683,353, Cl. 200-8.00R.
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Yalpani, Manssur, to British Columbia Research Council. Process for the preparation of aminated polysaccharide derivatives. 4,683,298, Cl. 536-45.000.
Yamada, Hiroyasu; Shiraishi, Motoatsu; Tazou, Ken; Nakamura, Mitsuki; Kageyama, Ryoichi; Namiki, Akira; and Sasagawa, Masaru, to Honda Giken Kogyo Kabushiki Kaisha. Conveyor in plastic working machine. 4,682,685, Cl. 198-621.000.
Yamada, Mitsuhiko: *See—*
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Yamada, Sadao; Takayama, Takeshi; Seshimoto, Osamu; and Yamaguchi, Akira, to Fuji Photo Film Co., Ltd. Method of manufacturing ion selective electrode pair. 4,683,048, Cl. 204-416.000.
Yamada, Toshihiro: *See—*
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Yamagishi, Tooru, to Victor Company of Japan, Ltd. Digital signal decoding system. 4,683,571, Cl. 371-37.000.
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Yamaguchi, Yasutaka, to NEC Corporation. Semiconductor device comprising polycrystalline silicon resistor element. 4,682,402, Cl. 29-571.000.
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Yamamoto, Etsuji; Kohno, Hideki; Kuroda, Masao; Matsui, Shigeru; and Shiono, Hidemi, to Hitachi, Ltd. Imaging method and apparatus using nuclear magnetic resonance. 4,683,433, Cl. 324-309.000.
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Yamamoto, Mikio, to Tokyo Electric Co., Ltd. Product sales data processing system for on-line connection to host CPU. 4,683,536, Cl. 364-408.000.
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Yamauchi, Kazushi; Ogata, Muneyuki; Kobayashi, Tomio; Kubota, Makoto; and Kumura, Tatsuo, to Sony Corporation. Magnetic thin film. 4,683,012, Cl. 148-301.000.

Yamaura, Junichi: *See*—
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Yanami, Tetsuji; Murai, Yoshiyuji; and Oshima, Ryoichi, to Daicel Chemical Industries Ltd. Process for the preparation of glycosides. 4,683,297, Cl. 536-18.600.

Yangas, Roger A. Reflective apparatus for microwave cooking. 4,683,362, Cl. 219-10.55F.

Yano, Takashi; and Yoneyama, Yasuo, to Fujisoku Electric Co., Ltd. Changeover switch. 4,683,352, Cl. 200-6.00R.

Yao, Raymond C.: *See*—
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Yasuoka, Toshio, to Teijin Limited. Carpet having bottom portions of pile covered with carbon black containing resin. 4,683,158, Cl. 428-95.000.

Yawberg, Richard C.: *See*—
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Yazvac, Thomas A., to General Electric Company. Integrated lighting panelboard and wiring gutter assembly. 4,683,517, Cl. 361-358.000.

Yeda Research and Development Co., Ltd.: *See*—
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Yeh, Ching-Hsuan. Tumbler plate cylinder lock. 4,682,484, Cl. 70-364.00R.

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Yokemura, Taketoshi: *See*—
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Yonekubo, Ken: *See*—
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Yoshikawa, Yoshihiko, to Mitsubishi Denki Kabushiki Kaisha. High-frequency amplifier device. 4,683,440, Cl. 330-51.000.

Yoshimitsu, Tsutsui: *See*—
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Yoshimura, Masato; and Ohsaki, Ryoshei, to Oki Electric Industry Co., Ltd. Paper feed mechanism for printer. 4,682,904, Cl. 400-616.000.

Yoshimura, Toshiteru, to Mazda Motor Corporation. Steering column support structure for a vehicle steering mechanism. 4,682,788, Cl. 280-779.000.

Yoshimura, Tsuneo: *See*—
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Yoshino, Shigeru, to Silver Seiko Limited. Industrial robot. 4,682,932, Cl. 414-744.00A.

Yoshinori, Toyoguchi; Yamaura, Junichi; Matsui, Tooru; and Iijima, Takashi, to Matsushita Electric Industrial Co., Ltd. Rechargeable electrochemical apparatus. 4,683,182, Cl. 429-194.000.

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Yoshioka, Yasuo: *See*—
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Yoshitake, Makoto; and Kishimoto, Keiichi, to Toray Silicone Co., Ltd. Thermal stabilizer for organopolysiloxane oils. 4,683,319, Cl. 556-425.000.

Yoshitsugu, Noritada: *See*—
Katsuno, Mitsuaki; Gyoda, Toshio; Tanaka, Hideki; Hurumoto, Kunihiro; Yoshitsugu, Noritada; and Matsui, Kenji, 4,682,790, Cl. 280-801.000.

Yoshiura, Shoichiro: *See*—
Fujiwara, Katsuyoshi; Miwa, Yoshihisa; and Yoshiura, Shoichiro, 4,682,877, Cl. 355-3.00R.

Younes, Usama E., to Atlantic Richfield Company. Composition comprising a matrix resin, a flame retarding synergist, and an alternating copolymer of brominated styrene and N-brominated phenyl maleimide. 4,683,084, Cl. 252-609.000.

Young, Brad J. Portable low profile mechanical scales. 4,682,665, Cl. 177-139.000.

Young, Donald C., to Union Oil Company of California. Methods for enhancing the productivity of plants. 4,682,999, Cl. 71-28.000.

Young, Gladstone F.; Green, Richard F.; Miller, S. David; and Quinlan, Thomas J., III, to Data Switch Corporation. Matrix switch system. 4,683,564, Cl. 370-63.000.

Young, Gordon W. Teleconferencing and teaching method and apparatus. 4,682,957, Cl. 434-307.000.

Young, Ian R., to Picker International, Inc. Nuclear magnetic resonance methods and apparatus. 4,683,432, Cl. 324-309.000.

Young, James P.; Weber, Robert J.; and Kaelin, G. Robert, to United States of America, Air Force. Monolithic low noise amplifier with limiting. 4,683,443, Cl. 330-277.000.

Young, Robert N.: *See*—
Frenette, Richard; Rokach, Joshua; Kakushima, Masatoshi; and Young, Robert N., 4,683,325, Cl. 560-10.000.

Young, Ronald F.: *See*—
Weaver, Robert J.; Young, Ronald F.; and Crockett, Dennis D., 4,683,011, Cl. 148-26.000.

Yount, Larry J.; Wilt, Nicholas J.; Hill, Bryan H.; and Peterson, Donald A., Jr., to Honeywell Inc. Real-time software monitor and write protect controller. 4,683,532, Cl. 364-200.000.

YuHan Corporation Co., Ltd.: *See*—
Suh, Jung J.; and Hong, You H., 4,683,306, Cl. 544-33.000.

Yukitomo, Kazuo: *See*—
Iwamoto, Tadashi; Ikeda, Toshiki; Yukitomo, Kazuo; Hattori, Masaichi; Arakawa, Kaneyasu; Kihira, Koichi; and Hanaki, Akira, 4,683,403, Cl. 315-83.000.

Yusa, Atsushi, to Olympus Optical Co., Ltd. Method for purifying an industrial raw material gas and a purifier for use in said method and a method of manufacturing said purifier. 4,683,125, Cl. 423-219.000.

Yuto, Masso; and Suzuki, Yoichi, to Sumitomo Electric Industries, Ltd. Foamed plastic insulated wire and method for producing same. 4,683,166, Cl. 428-314.800.

Zahlaus, Alfred, to Alfa-Laval Cheese Systems Limited. Processing of curd. 4,682,538, Cl. 99-453.000.

Zarka, Michel, to Contact Securite - Societe d'Exploitation. Wheeled stretcher in which the plane on which the patient lies is adaptable in height. 4,682,810, Cl. 296-20.000.

Zavada, Richard: *See*—
Oyler, John F.; Brand, Jerry D.; and Zavada, Richard, 4,683,029, Cl. 196-14.520.

Zeblisky, Rudolph J.: *See*—
Morrissey, Denis M.; Takach, Peter E.; and Zeblisky, Rudolph J., 4,683,036, Cl. 204-15.000.

Zelms, Charles M.: *See*—
Rouse, David M.; Wallace, Richard E.; and Zelms, Charles M., 4,683,563, Cl. 370-16.000.

Ziegler, Hans: *See*—
Bierbaum, Joe; Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,682,555, Cl. 112-262.100.

Zierenberg, Bernd; and Gupte, Arun R., to Boehringer Ingelheim KG. Divisible pharmaceutical tablet with delayed active ingredient release. 4,683,131, Cl. 424-467.000.

Zimmerman, Matt J., to Tektronix, Inc. Line frequency switching power supply. 4,683,415, Cl. 323-282.000.

Zimmerman, Theodore S.; Ruggeri, Zaverio M.; and Houghten, Richard, to Scripps Clinic and Research Foundation. Platelet binding inhibitors. 4,683,291, Cl. 530-324.000.

Zimmermann, Eberhard; and Stroetmann, Michael. Resorptive sheet material for closing and healing wounds and method of making the same. 4,683,142, Cl. 427-2.000.

Zipp, Adam: *See*—
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,683,209, Cl. 436-14.000.

Zolton, Gregory P., II: *See*—
Harth, George H., III; Zolton, Gregory P., II; and Copen, Robert L., 4,682,397, Cl. 29-407.000.

Zotos International, Inc.: *See*—
Giuliano, James T., 4,682,612, Cl. 132-73.000.

Zsida, Attila, to Grams, Christiane. Solar energy collector and sun motor utilizing same. 4,682,582, Cl. 126-440.000.

Zuranski, Edward S.: *See*—
Betts, William L.; and Zuranski, Edward S., 4,683,578, Cl. 375-98.000.

Zwick, David J., to Coleman Company, Inc., The. Canvas retaining assembly for camping trailer. 4,682,618, Cl. 135-89.000.

Zwiers, Renso J. M.: *See*—
Broer, Dirk J.; Zwiers, Renso J. M.; and Jochem, Cornelis M. G., 4,682,853, Cl. 350-128.000.

Zytec Corporation: *See*—
Buchet, James D., II, 4,683,529, Cl. 363-44.000.

501 Granulite Limited: *See*—
Walker, Bryan J., 4,683,006, Cl. 106-288.00R.

501 Hoya Corporation: *See*—
Shimizu, Yasumoto; and Matsudaira, Takeo, 4,683,044, Cl. 204-192.260.

501 Woven Electronics Corporation: *See*—
Piper, Douglas E.; and Black, Michael D., 4,682,828, Cl. 439-92.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JULY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Afonso, Adriano; and Hon, Frank, to Schering Corporation. AZA penem compounds. Re. 32,465, Cl. 514-210.000.

Aine, Harry E. Thin film recording and method of making. Re. 32,464, Cl. 428-622.000.

Ainsworth, Clifford L.: *See*—
Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., Re. 32,463, Cl. 175-48.000.

Hon, Frank: *See*—
Afonso, Adriano; and Hon, Frank, Re. 32,465, Cl. 514-210.000.

Leach, Clifford H.: *See*—
Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., Re. 32,463, Cl. 175-48.000.

Mita Industrial Co Ltd.: *See*—
Miyakawa, Nobuhiro, Re. 32,466, Cl. 503-208.000.

Miyakawa, Nobuhiro, to Mita Industrial Co Ltd. Heat-sensitive color-forming recording material and process for preparation thereof. Re. 32,466, Cl. 503-208.000.

Norton Christensen, Inc.: *See*—
Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., Re. 32,463, Cl. 175-48.000.

Schering Corporation: *See*—
Afonso, Adriano; and Hon, Frank, Re. 32,465, Cl. 514-210.000.

Westlake, John H.; Leach, Clifford H.; and Ainsworth, Clifford L., to Norton Christensen, Inc. Method of and apparatus for telemetering information from a point in a well borehole to the earth's surface. Re. 32,463, Cl. 175-48.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Alfa Chemicals Italiana S.p.A.: *See*—
Cannata, Vincenzo; and Tamerlani, Giancarlo, B1 4,423,244, Cl. 562-466.000.

BASF Wyandotte Corporation: *See*—
Kaneko, Thomas M., B1 4,351,753, Cl. 252-357.000.

Cannata, Vincenzo; and Tamerlani, Giancarlo, to Alfa Chemicals Italiana S.p.A. Process for the preparation of the d-2-(6-methoxy-2-naphthyl)-propionic acid. B1 4,423,244, 7-28-87, Cl. 562-466.000.

Kaneko, Thomas M., to BASF Wyandotte Corporation. Liquified normally solid polyoxyalkylene block copolymers. B1 4,351,753, 7-28-87, Cl. 252-357.000.

Tamerlani, Giancarlo: *See*—
Cannata, Vincenzo; and Tamerlani, Giancarlo, B1 4,423,244, Cl. 562-466.000.

LIST OF DESIGN PATENTEES

Adler, Janet F.: *See*—
Koester, Betty L.; and Adler, Janet F., 291,104, Cl. D21-173.000.

Ago, Nobuhiro; and Tsuboi, Takayuki, to Canon Kabushiki Kaisha. Camera. 291,090, 7-28-87, Cl. D16-6.000.

American Telephone & Telegraph Co., AT&T Technologies, Inc.: *See*—
Davidson, Charles B., 291,083, Cl. D14-63.000.

Anchor Hocking Corporation: *See*—
Pugh, Richard E., 291,065, Cl. D9-418.000.

Andersson, Krister. Transporting device. 291,136, 7-28-87, Cl. D34-28.000.

Antoine, Jean-Luc. Packaging container. 291,066, 7-28-87, Cl. D9-418.000.

Antonious, Anthony J. Golf club head. 291,106, 7-28-87, Cl. D21-219.000.

Arneteg, Ingemar, to Stellana Plast AB. Bracket for use in a trolley member. 291,138, 7-28-87, Cl. D34-35.000.

Aspen Laboratories, Inc.: *See*—
McCune, William L., 291,123, Cl. D24-21.000.

Baisch, Herbert: *See*—
Handler, Milton E.; Sylvan, Richard; Baisch, Herbert; and Peterson, Michael, 291,037, Cl. D6-432.000.

Bardue, Casey M.: *See*—
Jones, Paul W.; and Bardue, Casey M., 291,121, Cl. D24-17.000.

Bartasevich, William E., Jr.: *See*—
Lackner, John R.; and Bartasevich, William E., Jr., 291,129, Cl. D32-31.000.

Bauer, Horst, to Carl Platz GmbH. Spray gun. 291,113, 7-28-87, Cl. D23-17.000.

Beghin-Say, S.A.: *See*—
Minost, Henri, 291,067, Cl. D9-418.000.

Bertrand, Vic, to Ritvik Group Inc., The. Toy construction piece. 291,099, 7-28-87, Cl. D21-108.000.

Bianchi Scarpa, Afra: *See*—
Scarpa, Tobia; and Bianchi Scarpa, Afra, 291,036, Cl. D6-399.000.

Bird, Samuel W., Jr. Armrest enclosure for an automobile telephone. 291,026, 7-28-87, Cl. D3-40.000.

Blaisdell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Fluorescent lamp. 291,124, 7-28-87, Cl. D26-3.000.

Bohjort, Bengt, to Miniman Security AB. Protective helmet with retractable goggles. 291,127, 7-28-87, Cl. D29-15.000.

Bokmiller, David J., to Sani-Fresh International, Inc. Cleaning wand caddy. 291,039, 7-28-87, Cl. D6-551.000.

Breil, Randy J. Telephone line polarity tester. 291,071, 7-28-87, Cl. D10-78.000.

Brun, Serge, to Calor S.A. Electric iron. 291,130, 7-28-87, Cl. D32-70.000.

Brunswick Corporation: *See*—
Robbins, Richard J., 291,108, Cl. D22-141.000.

Buchin, Karl, to Krone GmbH. Telephone set. 291,082, 7-28-87, Cl. D14-53.000.

Burks, Kenneth: *See*—
Jones, Charles; Murphy, James L.; and Burks, Kenneth, 291,068, Cl. D10-30.000.

Burns, David W. Rocking chair. 291,034, 7-28-87, Cl. D6-348.000.

Butterfield, George. Illuminated picture frame. 291,030, 7-28-87, Cl. D6-308.000.

Caldeira, Adelino, to Kangaroos U.S.A., Inc. Pocketed shoe. 291,021, 7-28-87, Cl. D2-309.000.

Calor S.A.: *See*—
Brun, Serge, 291,130, Cl. D32-70.000.

Campbell, Bruce R., to IVAC Corporation. Enteric pump. 291,119, 7-28-87, Cl. D24-8.000.

Canning, Glenn R. Beverage can holder. 291,044, 7-28-87, Cl. D7-70.000.

Canon Kabushiki Kaisha: *See*—
Ago, Nobuhiro; and Tsuboi, Takayuki, 291,090, Cl. D16-6.000.
Hirooka, Junji, 291,027, Cl. D3-76.000.
Yomo, Takashi, 291,096, Cl. D18-13.000.

Carl Platz GmbH: *See*—
Bauer, Horst, 291,113, Cl. D23-17.000.
Centro Studi E Servizi Moda Di Paolo Bertagnin E C. S.A.S.: *See*—
Scarpa, Tobia; and Bianchi Scarpa, Afra, 291,036, Cl. D6-399.000.
Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH & Co. KG. Fountain brush. 291,028, 7-28-87, Cl. D4-115.000.
Clivio: Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH. Combined pressure reducer and fertilizer dispenser. 291,112, 7-28-87, Cl. D23-3.000.
Conair Corporation: *See*—
Haber, Barry; and Walkley, Charles, 291,064, Cl. D9-415.000.
Convergent Technologies, Inc.: *See*—
Nuttall, Michael J.; Freige, Diab E.; and Keely, Leroy B., 291,085, Cl. D14-113.000.
Cosco, Inc.: *See*—
Sauter, Bruce M.; and Snyder, Orville E., 291,032, Cl. D6-333.000.
Crist, Craig W.: *See*—
Drake, Craig D.; and Crist, Craig W., 291,023, Cl. D3-35.000.
Dalbey, Gary L.; and Huston, Ronald L., to Hulsizer's, Inc. Display panel for shelving. 291,097, 7-28-87, Cl. D20-44.000.
Dart Container Corporation: *See*—
Dart, Robert C., 291,040, Cl. D7-6.000.
Dart Industries Inc.: *See*—
Fahey, William K.; and Picozza, Augusto A., 291,042, Cl. D7-27.000.
Dart, Robert C., to Dart Container Corporation. Beverage cup. 291,040, 7-28-87, Cl. D7-6.000.
Davidson, Charles B., to American Telephone & Telegraph Co., AT&T Technologies, Inc. Telephone handset. 291,083, 7-28-87, Cl. D14-63.000.
Decursu, Giorgio, to Elesa S.p.A. Knob. 291,053, 7-28-87, Cl. D8-310.000.
Delepine, Jean-Claude. Spout. 291,115, 7-28-87, Cl. D23-32.000.
DeMars, Robert A. Refuse container. 291,134, 7-28-87, Cl. D34-5.000.
Designs for Vision, Inc.: *See*—
Feinbloom, Richard E.; and Yee, Lung T., 291,091, Cl. D16-130.000.
DiFede, John. Plastic bucket lid removal tool. 291,051, 7-28-87, Cl. D8-40.000.
Disanza, Paul. Leaf and cuttings gatherer. 291,133, 7-28-87, Cl. D34-1.000.
Drake, Craig D.; and Crist, Craig W., to Ring King Visibles, Inc. Storage case for flat articles. 291,023, 7-28-87, Cl. D3-35.000.
Durand, Jean-Jacques. Multi-purpose bowl or similar article. 291,043, 7-28-87, Cl. D7-28.000.
Egli, Christoph, to Telefonaktiebolaget LM Ericsson. Typewriter. 291,092, 7-28-87, Cl. D18-1.000.
Ehrenfried, Katherine M. Doll head. 291,105, 7-28-87, Cl. D21-190.000.
Elesa S.p.A.: *See*—
Decursu, Giorgio, 291,053, Cl. D8-310.000.
Eltech Systems Corporation: *See*—
Miller, Thomas M.; and Schraff, Raymond J., 291,118, Cl. D23-82.000.
Erickson, Richard D. Disposable shoe shine kit. 291,022, 7-28-87, Cl. D3-30.500.
F.I.R. Rubinetterie S.p.A.: *See*—
Piesco, Nazzareno, 291,114, Cl. D23-25.000.
Fahey, William K.; and Picozza, Augusto A., to Dart Industries Inc. Compartmented dish. 291,042, 7-28-87, Cl. D7-27.000.
Feinbloom, Richard E.; and Yee, Lung T., to Designs for Vision, Inc. Combined beam splitter and optical coupler for connecting a light source to a television camera during surgical procedures. 291,091, 7-28-87, Cl. D16-130.000.
Fenne, Kenneth R., to Pittway Corporation. Timer. 291,069, 7-28-87, Cl. D10-40.000.
Fenne, Kenneth R., to Pittway Corporation. Night-light. 291,125, 7-28-87, Cl. D26-26.000.
Freige, Diab E.: *See*—
Nuttall, Michael J.; Freige, Diab E.; and Keely, Leroy B., 291,085, Cl. D14-113.000.
Fukuhara, Kunihiro; and Naruse, Masayuki, to Nifco Inc. Panel fastener or similar article. 291,055, 7-28-87, Cl. D8-354.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed boot upper. 291,020, 7-28-87, Cl. D2-272.000.
Gaptjern, Ingrid E. Combined cigarette snuffer and holder. 291,126, 7-28-87, Cl. D27-2.000.
Gardena Kress & Kastner GmbH: *See*—
Clivio: Franco; and Raffler, Dieter, 291,112, Cl. D23-3.000.
Gardena Kress & Kastner GmbH & Co. KG: *See*—
Clivio, Franco; and Raffler, Dieter, 291,028, Cl. D4-115.000.
Grandsart, Barbara S. Jockey helmet. 291,128, 7-28-87, Cl. D29-15.000.
Grange, Kenneth. Covered vegetable dish. 291,041, 7-28-87, Cl. D7-18.000.
Grout, Raymond F.: *See*—
Purvis, Grant D.; Grout, Raymond F.; and Harrison, Grant, 291,029, Cl. D4-118.000.
Grubb, Lawrence B.; and Kelly, Lois E., to Johnson & Johnson Baby Products Company. Teething toy. 291,122, 7-28-87, Cl. D24-45.000.
GTE Products Corporation: *See*—
Blaisdell, Ronald G.; and Hough, Harold L., 291,124, Cl. D26-3.000.
Mickelson, N. Peter; and Napiorkowski, John J., 291,081, Cl. D14-52.000.
Guermandi, Romano, to Societa' Pneumatici Pirelli. Tire for a vehicle wheel. 291,073, 7-28-87, Cl. D12-146.000.
Haber, Barry; and Walkley, Charles, to Conair Corporation. Packaging container for a telephone. 291,064, 7-28-87, Cl. D9-415.000.
Haggard, Merry: *See*—
Haggard, Robert E., 291,049, Cl. D8-1.000.
Haggard, Robert E., to Haggard, Merry. Tree drain grate or similar article. 291,049, 7-28-87, Cl. D8-1.000.
Handler, Milton E.; Sylvan, Richard; Baisch, Herbert; and Peterson, Michael, to Hirsh Company. Storage cabinet. 291,037, 7-28-87, Cl. D6-432.000.
Hans Grohe GmbH & Co KG: *See*—
Haug, Andreas; and Schonherr, Thomas, 291,116, Cl. D23-32.000.
Hanyu, Susumu, to Janome Sewing Machine Co. Ltd. Sewing machine. 291,088, 7-28-87, Cl. D15-69.000.
Harada, Toshio: *See*—
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 291,048, Cl. D7-351.000.
Harrison, Grant: *See*—
Purvis, Grant D.; Grout, Raymond F.; and Harrison, Grant, 291,029, Cl. D4-118.000.
Hasbro Industries, Inc.: *See*—
Knight, Elizabeth, 291,103, Cl. D21-165.000.
Hashimoto, Masanori: *See*—
Morozumi, Kiyotaka; Hashimoto, Masanori; and Minagawa, Masahiro, 291,095, Cl. D18-13.000.
Haug, Andreas; and Schonherr, Thomas, to Hans Grohe GmbH & Co KG. Spout. 291,116, 7-28-87, Cl. D23-32.000.
Hebert, Loney J., Jr. Tree sculpture. 291,072, 7-28-87, Cl. D11-118.000.
Helix Limited: *See*—
Warwicker, Clive W., 291,139, Cl. D99-28.000.
Henshaw, Garry E. Combination bottle opener and resealer. 291,052, 7-28-87, Cl. D8-40.000.
Hice, James E. Shelf unit. 291,038, 7-28-87, Cl. D6-479.000.
Hill, Royce W., to Micro Plastics, Inc. Circuit board support. 291,056, 7-28-87, Cl. D8-354.000.
Hirooka, Junji, to Canon Kabushiki Kaisha. Case for a word processor. 291,027, 7-28-87, Cl. D3-76.000.
Hirsh Company: *See*—
Handler, Milton E.; Sylvan, Richard; Baisch, Herbert; and Peterson, Michael, 291,037, Cl. D6-432.000.
Hough, Harold L.: *See*—
Blaisdell, Ronald G.; and Hough, Harold L., 291,124, Cl. D26-3.000.
Hulsizer's, Inc.: *See*—
Dalbey, Gary L.; and Huston, Ronald L., 291,097, Cl. D20-44.000.
Huston, Ronald L.: *See*—
Dalbey, Gary L.; and Huston, Ronald L., 291,097, Cl. D20-44.000.
Ichihara, Masuo: *See*—
Kubo, Masayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 291,048, Cl. D7-351.000.
Interlego A.G.: *See*—
Knudsen, Jens N., 291,100, Cl. D21-108.000.
Knudsen, Jens N.; and Krentz, Daniel A., 291,101, Cl. D21-108.000.
International Business Machines Corporation: *See*—
Wang, James P., 291,093, Cl. D18-12.000.
Ise, Yoji, to Myotoku Ltd. Ram for industrial robots or the like. 291,089, 7-28-87, Cl. D15-199.000.
Ito, Yuji: *See*—
Kawaguchi, Tsutomu; and Ito, Yuji, 291,076, Cl. D12-181.000.
IVAC Corporation: *See*—
Campbell, Bruce R., 291,119, Cl. D24-8.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu, 291,088, Cl. D15-69.000.
Johnson & Johnson Baby Products Company: *See*—
Grubb, Lawrence B.; and Kelly, Lois E., 291,122, Cl. D24-45.000.
Johnson, Stanley A., to Vollrath Company, The. Spoon. 291,046, 7-28-87, Cl. D7-137.000.
Jones, Charles; Murphy, James L.; and Burks, Kenneth, to Sports Timer, Inc. Sports timer. 291,068, 7-28-87, Cl. D10-30.000.
Jones, Paul W.; and Bardue, Casey M., to Physio-Control Corporation. Interfacing cassette for use with a defibrillator or the like. 291,121, 7-28-87, Cl. D24-17.000.
Kaminski, Stephen H.: *See*—
Strousse, Babette L.; and Kaminski, Stephen H., 291,035, Cl. D6-380.000.
Kangaroos U.S.A., Inc.: *See*—
Caldeira, Adelino, 291,021, Cl. D2-309.000.
Gamm, Robert J., 291,020, Cl. D2-272.000.
Katsuno, Akira: *See*—
Keitoku, Noboru; and Katsuno, Akira, 291,080, Cl. D14-30.000.
Kawaguchi, Tsutomu; and Ito, Yuji, to Toyoda Jidosha Kabushiki Kaisha. Air spoiler for a vehicle. 291,076, 7-28-87, Cl. D12-181.000.
Keely, Leroy B.: *See*—
Nuttall, Michael J.; Freige, Diab E.; and Keely, Leroy B., 291,085, Cl. D14-113.000.
Keitoku, Noboru; and Katsuno, Akira, to Pioneer Electronic Corporation. Loudspeaker. 291,080, 7-28-87, Cl. D14-30.000.
Kelly, Lois E.: *See*—
Grubb, Lawrence B.; and Kelly, Lois E., 291,122, Cl. D24-45.000.
Kikuchi, Katsutoshi, to Sony Corporation. Case for a magnetic tape cassette or the like. 291,024, 7-28-87, Cl. D3-35.000.
Kitahashi, Seiichiro, to Toyota Jidosha Kabushiki Kaisha. Front bumper for an automobile. 291,075, 7-28-87, Cl. D12-169.000.
Knight, Elizabeth, to Hasbro Industries, Inc. Design for a toy pony. 291,103, 7-28-87, Cl. D21-165.000.
Knudsen, Jens N., to Interlego A.G. Toy building block. 291,100, 7-28-87, Cl. D21-108.000.

Knudsen, Jens N.; and Krentz, Daniel A., to Interlego A.G. Toy construction piece. 291,101, 7-28-87, Cl. D21-108.000.

Koester, Betty L.; and Adler, Janet F. Girl clown rag doll. 291,104, 7-28-87, Cl. D21-173.000.

Kolb, Richard P.: *See—*
Prince, Anthony P.; Kolb, Richard P.; and Stevens, Myron T., 291,063, Cl. D9-401.000.

Komar, Michael N., to TI Russell Hobbs Limited. Pressing iron. 291,131, 7-28-87, Cl. D32-70.000.

Komar, Michael N., to TI Russell Hobbs Limited. Stand for a pressing iron. 291,132, 7-28-87, Cl. D32-73.000.

Krentz, Daniel A.: *See—*
Knudsen, Jens N.; and Krentz, Daniel A., 291,101, Cl. D21-108.000.

Krone GmbH: *See—*
Buchin, Karl, 291,082, Cl. D14-53.000.

Kubo, Marayoshi; Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 291,048, 7-28-87, Cl. D7-351.000.

Lackner, John R.; and Bartasevich, William E., Jr., to Scott & Fetzer Company, The. Vacuum cleaner bracket. 291,129, 7-28-87, Cl. D32-31.000.

Linn, Richard A., to Padco, Inc. Tank for pressure feeding of paint or other liquids. 291,111, 7-28-87, Cl. D23-2.000.

Luongo, William A. Combined tie and belt rack. 291,031, 7-28-87, Cl. D6-323.000.

MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 291,060, 7-28-87, Cl. D9-389.000.

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ISSUED JULY 28, 1987

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15 4,683,036
64 R 4,683,037
93 4,683,038
95 4,683,039
98 4,683,040
4,683,041
180.1 4,683,042
192.15 4,683,043
192.26 4,683,044
206 4,683,045
243 M 4,683,047
243 R 4,683,046
416 4,683,048
428 4,683,049

CLASS 206

1.5 4,682,688
222 4,682,689
223 4,682,513
305 4,682,690
373 4,682,691
459 4,682,692
583 4,682,693

CLASS 208

110 4,683,050
111 4,683,051
4,683,052

CLASS 209

559 4,682,694
571 4,682,695

CLASS 210

36 4,683,053
91 4,683,054
120 4,683,055
186 4,683,056
232 4,683,057
359 4,683,058
404 4,683,059
448 4,683,060
512.1 4,683,061
605 4,683,064
617 4,683,062
634 4,683,063
668 4,683,065
734 4,683,066
767 4,683,067

CLASS 211

43 4,682,696
45 4,682,697
70.6 4,682,698
71 4,682,699

CLASS 215

216 4,682,700
230 4,682,701
232 4,682,702
247 4,682,703
329 4,682,704

CLASS 219

10.43 4,683,361
10.55 A 4,683,363
10.55 F 4,683,362
69 R 4,683,364
121 ER 4,683,366
121 LC 4,683,365
121 PY 4,683,367
146.1 4,683,368
364 4,683,369
370 4,683,370

CLASS 220

93 4,682,705
276 4,682,706
307 4,682,707
460 4,682,708

CLASS 221

2 4,682,709

CLASS 222

63 4,682,710
75 4,682,711
137 4,682,712
153 4,682,713
4,682,714
175 4,682,715
529 4,682,716
591 4,682,717
4,682,718

CLASS 224

310 4,682,719
311 4,682,720

CLASS 227

67 4,682,721

CLASS 228

39 4,682,723
41 4,682,722
50 4,682,724
119 4,682,725

CLASS 229

108 4,682,726
915 4,682,727

CLASS 235

487 4,683,371
492 4,683,372

CLASS 236

12.12 4,682,728

CLASS 239

2.2 4,682,729
109 4,682,730
119 4,682,731
123 4,682,732
265.39 4,682,733
315 4,682,734
690 4,682,735
736 4,682,736

CLASS 241

34 4,682,737
56 4,682,738
275 4,682,739
282.1 4,682,740

CLASS 242

55 4,682,741
56 R 4,682,742
58.6 4,682,743

CLASS 244

158 R 4,682,744
161 4,682,745
207 4,682,746

CLASS 248

68.1 4,682,747
73 4,682,748
284 4,682,749
421 4,682,750
503 4,682,751
550 4,682,752
562 4,682,753
639 4,682,754

CLASS 250

221 4,683,373
227 4,683,374
231 SE 4,683,375
309 4,683,376
327.2 4,683,377
492.2 4,683,378
493.1 4,683,379
548 4,683,380

CLASS 251

4 4,682,755
63.5 4,682,756
77 4,682,757
84 4,682,758
210 4,682,759

CLASS 252

8.551 4,683,068
32.7 E 4,683,069
33.4 4,683,070
49.3 4,683,071
102 4,683,072
135 4,683,073
136 4,683,074
171 4,683,075
191 4,683,076
194 4,683,077
299.61 4,683,078
299.67 4,683,079
357 B1 4,351,753
364 4,683,080
392 4,683,081
506 4,683,082
522 R 4,683,083
609 4,683,084

CLASS 254

199 4,682,760

CLASS 256

36 4,682,761
65 4,682,762

CLASS 260

349 4,683,085
4,683,086
396 R 4,683,087
409 4,683,088
501.16 4,683,089
513 R 4,683,100
543 R 4,683,090
4,683,091

CLASS 261

146 4,683,101

CLASS 264

4.3 4,683,092
22 4,683,093
38 4,683,094
171 4,683,095
249 4,683,096
268 4,683,097
302 4,683,098
511 4,683,099

CLASS 267

89 4,682,763

CLASS 269

3 4,682,764
41 4,682,765
71 4,682,766

CLASS 270

45 4,682,767

CLASS 271

3.1 4,682,768
10 4,682,769
176 4,682,770

CLASS 272

73 4,682,771
113 4,682,772

CLASS 273

26 B 4,682,773
84 R 4,682,774
186 A 4,682,775
189 A 4,682,776
243 4,682,777
257 4,682,778

CLASS 277

34.3 4,682,779

CLASS 279

79 4,682,780

CLASS 280

22 4,682,781
33.99 B 4,682,782
242 WC 4,682,783
4,682,784
615 4,682,785
628 4,682,786
775 4,682,787
779 4,682,788
801 4,682,789
4,682,790
806 4,682,791

CLASS 281

45 4,682,792

CLASS 282

11.5 A 4,682,793

CLASS 283

82 4,682,794

CLASS 285

1 4,682,795
39 4,682,796
40 4,682,797
174 4,682,798

CLASS 292

169.15 4,682,799
247 4,682,800
251.5 4,682,801
337 4,682,802

CLASS 294

25 4,682,803
82.26 4,682,804
86.4 4,682,805
88 4,682,806
161 4,682,807

CLASS 296

1 S 4,682,808
20 4,682,810
31 P 4,682,809
181 4,682,811
195 4,682,812

CLASS 297

192 4,682,813
300 4,682,814
4,682,815
359 4,682,816
408 4,682,817
452 4,682,818

CLASS 299

10 4,682,819

CLASS 301

37 P 4,682,820
37 R 4,682,821

CLASS 303

20 4,682,822
22 R 4,682,823
92 4,682,824

CLASS 307

125 4,683,381
296 R 4,683,382
473 4,683,383
475 4,683,384
518 4,683,385
549 4,683,386
571 4,683,387

CLASS 310

46 4,683,388
62 4,683,389
71 4,683,390
90.5 4,683,391
105 4,683,392
156 4,683,393
313 R 4,683,394
4,683,395
358 4,683,396

CLASS 312

42 4,682,825
4,682,826
231 4,682,827

CLASS 313

344 4,683,397
474 4,683,398
537 4,683,399

CLASS 314

214 4,683,230

CLASS 315

3.5 4,683,400
39 4,683,401
56 4,683,402
83 4,683,403
289 4,683,404
371 4,683,405

CLASS 318

568 4,683,406
689 4,683,407
696 4,683,408
4,683,409
4,683,410
706 4,683,411
779 4,683,413
798 4,683,412

CLASS 320

13 4,683,414

CLASS 323

282 4,683,415
288 4,683,438
314 4,683,416

CLASS 324

60 C 4,683,417
61 P 4,683,418
64 4,683,419
73 R 4,683,420
96 4,683,421
133 4,683,422
158 F 4,683,423
4,683,424
4,683,425
204 4,683,426
207 4,683,427
208 4,683,428
225 4,683,429
241 4,683,430
249 4,683,535
306 4,683,431
309 4,683,432
4,683,433
4,683,434
442 4,683,435
458 4,683,436

CLASS 328

133 4,683,437

CLASS 330

10 4,683,439
51 4,683,440
69 4,683,441
261 4,683,442
277 4,683,443

CLASS 331

25 4,683,444
4,683,445
47 4,683,446
177 V 4,683,447

CLASS 332

7.51 4,683,448

CLASS 333

16 4,683,449
202 4,683,450

CLASS 335

174 4,683,451
234 4,683,452
255 4,683,453
299 4,683,454

CLASS 340

52 R 4,683,455
347 AD 4,683,456
4,683,457
347 DA 4,683,458
514 4,683,459
545 4,683,460
551 4,683,461
571 4,683,462
629 4,683,463
685 4,683,464
700 4,683,465
703 4,683,466
705 4,683,467
709 4,683,468
723 4,683,469
771 4,683,470
825.5 4,683,471
870.02 4,683,472

CLASS 342

172 4,683,473
368 4,683,474

CLASS 343

915 4,683,475

CLASS 346

29 4,683,476
75 4,683,477
76 PH 4,683,478
4,683,479
134 4,683,480
140 R 4,683,481
159 4,683,482

CLASS 350

3.7 4,682,841
6.7 4,682,842
96.15 4,682,843
4,682,844
96.18 4,682,845
4,682,846
96.20 4,682,847
96.21 4,682,848
96.22 4,682,849
96.23 4,682,850
96.34 4,682,851
105 4,682,852
128 4,682,853
255 4,682,854
276 R 4,682,855
319 4,682,856
331 T 4,682,857
334 4,682,858
414 4,682,859
423 4,682,860
432 4,682,861
4,682,862
463 4,682,863
511 4,682,864
607 4,682,865

CLASS 351

205 4,682,866
223 4,682,867

CLASS 353

58 4,682,868

CLASS 354

275 4,682,870
400 4,682,871
403 4,682,872
478 4,682,873

CLASS 355

3 4,682,879
3 DD 4,682,874
3 FU 4,682,878
3 R 4,682,875
4,682,876
4,682,877
4 4,682,880
10 4,682,881
14 D 4,682,882
38 4,682,883
51 4,682,884
67 4,682,885

CLASS 356

1 4,682,886
39 4,682,887
73 4,682,888
135 4,682,889
244 4,682,890
4,682,891
353 4,682,892
356 4,682,893
375 4,682,894
402 4,682,895

CLASS 357

13 4,683,483
16 4,683,484
22 4,683,485
23.6 4,683,486
34 4,683,487
42 4,683,488
81 4,683,489

CLASS 358

30 4,683,490
56 4,683,491
80 4,683,492
101 4,683,493
136 4,683,494
148 4,683,495
166 4,683,496
4,683,497
209 4,683,498
260 4,682,869
264 4,683,499
280 4,683,500
293 4,683,501
342 4,683,502

CLASS 360

64 4,683,503
78 4,683,504
98 4,683,505
105 4,683,506
109 4,683,507
113 4,683,508
119 4,683,509
132 4,683,510
4,683,511
137 4,683,512

CLASS 361

76 4,683,513
91 4,683,514
106 4,683,515
263 4,683,518
328 4,683,516
358 4,683,517
424 4,683,519
427 4,683,520

CLASS 362

80 4,683,521
135 4,683,522
267 4,683,523
268 4,683,524
346 4,683,525
4,683,526

CLASS 363

5 4,683,527
21 4,683,528
44 4,683,529

CLASS 364

200 4,683,530
4,683,531
4,683,532
4,683,533
4,683,534
408 4,683,536
426 4,683,537
4,683,538
431.05 4,683,539
468 4,683,540
500 4,683,541
508 4,683,542
513 4,683,543
4,683,544
565 4,683,545
748 4,683,546
4,683,547
786 4,683,548
900 4,683,549
4,683,550
4,683,551
4,683,552

CLASS 365

185 4,683,554
215 4,683,555

CLASS 366

120 4,682,896

CLASS 367

27 4,683,556

57 4,683,557
189 4,683,558

CLASS 369

44 4,683,559
45 4,683,560
4,683,561
284 4,683,562

CLASS 370

16 4,683,563
63 4,683,564
69.1 4,683,565
100 4,683,566
110.1 4,683,567

CLASS 371

12 4,683,568
25 4,683,569
36 4,683,570
37 4,683,571
4,683,572

CLASS 372

34 4,683,573
44 4,683,574
59 4,683,575
98 4,683,576

CLASS 373

105 4,683,577

CLASS 374

45 4,682,897
179 4,682,898

CLASS 375

98 4,683,578

CLASS 376

209 4,683,102
4,683,103
251 4,683,104
259 4,683,105
4,683,106
260 4,683,107
4,683,108
261 4,683,109
4,683,110
391 4,683,111
402 4,683,112
419 4,683,113
4,683,114
439 4,683,115
447 4,683,116
449 4,683,117

CLASS 377

11 4,683,579
60 4,683,580

CLASS 378

38 4,683,581
174 4,683,582

CLASS 379

200 4,683,583
269 4,683,584
398 4,683,351
426 4,683,585

CLASS 380

4 4,683,553
48 4,683,586
154 4,682,954

CLASS 381

25 4,683,587
61 4,683,588
4,683,589
71 4,683,590
85 4,683,591

CLASS 384

41 4,682,899
105 4,682,900
539 4,682,901

CLASS 490

18 4,682,902
121 4,682,903
616 4,682,904

CLASS 403

327 4,682,905
409.1 4,682,906

CLASS 404

25 4,682,907
84 4,682,908
90 4,682,909
94 4,682,910

CLASS 405

53 4,682,911
154 4,682,912
169 4,682,913
283 4,682,914

CLASS 406

31 4,682,915

CLASS 407

113 4,682,916

CLASS 408

212 4,682,917
241 R 4,682,918

CLASS 409

179 4,682,919
231 4,682,920
299 4,682,921

CLASS 410

30 4,682,922
90 4,682,923

CLASS 411

329 4,682,924
461 4,682,925

CLASS 414

11 4,682,926
217 4,682,927
416 4,682,928
589 4,682,929
4,682,930
623 4,682,931
744 A 4,682,932

CLASS 415

172 A 4,682,933

CLASS 416

198 A 4,682,934
223 A 4,682,935

CLASS 417

366 4,682,936
393 4,682,937

CLASS 418

1 4,682,938
178 4,682,939

CLASS 419

23 4,683,118

CLASS 420

444 4,683,119

CLASS 422

72 4,683,120
197 4,683,121
227 4,683,122

CLASS 423

2 4,683,123
6 4,683,124
219 4,683,125
280 4,683,126
321 R 4,683,127
338 4,683,128
351 4,683,129
579 4,683,130

CLASS 424

49 4,683,133
59 4,683,134
85 4,683,135
89 4,683,136
4,683,137
409 4,683,132
467 4,683,131

CLASS 425

34 R 4,682,940
72 R 4,682,941
103 4,682,942
130 4,682,943
549 4,682,944
4,682,945

CLASS 426

5 4,683,138
265 4,683,139
597 4,683,140
639 4,683,141

CLASS 427

2 4,683,142
8 4,683,143
34 4,683,148
35 4,683,144
36 4,683,145
38 4,683,149
54.1 4,683,146
4,683,147
239 4,683,150
397.8 4,683,151
428 4,683,152

CLASS 428

1 4,683,153
34 4,683,154
35 4,683,155
52 4,683,156
65 4,683,157
95 4,683,158
138 4,683,159
141 4,683,160
178 4,683,161
182 4,683,162
209 4,683,163
287 4,683,164
290 4,683,165
314.8 4,683,166
328 4,683,167
335 4,683,168
337 4,683,169
349 4,683,170
354 4,683,171
412 4,683,172
425.8 4,683,173
583 4,683,174
622 Re.32,464
677 4,683,175
692 4,683,176

CLASS 429

26 4,683,177
101 4,683,178
104 4,683,179
130 4,683,180
192 4,683,181
194 4,683,182

CLASS 430

20 4,683,183
57 4,683,184
4,683,185
84 4,683,186
106.6 4,683,187
110 4,683,188
248 4,683,189
281 4,683,190
291 4,683,191
567 4,683,192
570 4,683,193

CLASS 431

14 4,682,946
288 4,682,947

CLASS 432

58 4,682,948

CLASS 433

81 4,682,949
90 4,682,950
173 4,682,951

CLASS 434

12 4,682,952
16 4,682,953
191 4,682,955
237 4,682,956
307 4,682,957
335 4,682,958

CLASS 435

6 4,683,194
4,683,195
7 4,683,196
4,683,197
22 4,683,198
68 4,683,199
4,683,200
75 4,683,201
91 4,683,202
94 4,683,203
128 4,683,204
172.3 4,683,205
253 4,683,206
311 4,683,207

CLASS 436

12 4,683,208
14 4,683,209
50 4,683,210
4,683,211
52 4,683,212
501 4,683,213

CLASS 439

83 4,682,829
92 4,682,828
224 4,682,830
267 4,682,834
294 4,682,831
344 4,682,837
377 4,682,833
395 4,682,835
426 4,682,836
589 4,682,832
598 4,682,838
4,682,839
874 4,682,840

CLASS 440

53 4,682,959
4,682,960
61 4,682,961

CLASS 445

5 4,682,962
4,682,963
28 4,682,964
37 4,682,965

CLASS 446

101 4,682,966
113 4,682,967
268 4,682,968
279 4,682,969
309 4,682,970
450 4,682,971

CLASS 464

130 4,682,972

CLASS 474

263 4,682,973

CLASS 493

55 4,682,974
123 4,682,975
206 4,682,976
358 4,682,977

CLASS 502

66 4,683,214
107 4,683,215
159 4,683,216
214 4,683,217
302 4,683,218
304 4,683,219

CLASS 503

208 Re.32,466

CLASS 514

7 4,683,220
14 4,683,221
42 4,683,222
46 4,683,223
120 4,683,224
128 4,683,225
192 4,683,226
202 4,683,227
210 Re.32,465
211 4,683,228
213 4,683,229
220 4,683,231
228 4,683,232
253 4,683,233
256 4,683,234
282 4,683,235
288 4,683,236
4,683,237
292 4,683,238
299 4,683,239
390 4,683,240
512 4,683,241
539 4,683,242
557 4,683,243
568 4,683,244
652 4,683,245

CLASS 521

54 4,683,246
91 4,683,247
96 4,683,248
129 4,683,249

CLASS 522

33 4,683,250
46 4,683,251

CLASS 523

143 4,683,252
412 4,683,273
442 4,683,253
503 4,683,254

CLASS 524

151 4,683,255
285 4,683,256
432 4,683,257
434 4,683,258
447 4,683,259
512 4,683,260
566 4,683,261
608 4,683,262

CLASS 525

57 4,683,263
65 4,683,264
67 4,683,265
123 4,683,266
133 4,683,267
237 4,683,268
258 4,683,269
329.1 4,683,286
347 4,683,270
403 4,683,271
404 4,683,272

CLASS 526

216 4,683,274
262 4,683,275
4,683,276

CLASS 528

21 4,683,277
32 4,683,278
67 4,683,279
71 4,683,280
89 4,683,281
91 4,683,282
93 4,683,283
4,683,284
113 4,683,285
357 4,683,287
361 4,683,288
402 4,683,289
480 4,683,290

CLASS 530

324 4,683,291
328 4,683,292
359 4,683,293
371 4,683,294
391 4,683,295

CLASS 536

18.6 4,683,297
45 4,683,298
119 4,683,299

CLASS 539

558 4,683,296

CLASS 540

348 4,683,300
350 4,683,301
356 4,683,302
362 4,683,303
529 4,683,304
533 4,683,305

CLASS 544

33 4,683,306
198 4,683,307
211 4,683,308
353 4,683,309

CLASS 546

321 4,683,310

CLASS 548

240 4,683,311
341 4,683,312
437 4,683,313

CLASS 549

417 4,683,314

CLASS 556

12 4,683,315
38 4,683,316
64 4,683,317
173 4,683,318
425 4,683,319
453 4,683,320
478 4,683,321

CLASS 558

3 4,683,322
52 4,683,323
354 4,683,324

CLASS 560

10 4,683,325
51 4,683,330
75 4,683,326
86 4,683,327
118 4,683,328
338 4,683,329

CLASS 562

459 4,683,331
466 B1 4,423,244

CLASS 564

414 4,683,332
4,683,333
474 4,683,334
480 4,683,335
4,683,336
498 4,683,337

CLASS 568

12 4,683,338
41 4,683,339
331 4,683,340
366 4,683,341
464 4,683,342
594 4,683,343
716 4,683,344
726 4,683,345
765 4,683,346
869 4,683,347

CLASS 604

43 4,682,978
48 4,682,979
122 4,682,980
158 4,682,981

D2—	272	291,020
	309	291,021
D3—	30.5	291,022
	35	291,023
		291,024
		291,025
	40	291,026
	76	291,027
D4—	115	291,028
	118	291,029
D6—	308	291,030
	323	291,031
	333	291,032
	334	291,033
	348	291,034
	380	291,035
	399	291,036
	432	291,037
	479	291,038
	551	291,039
D7—	6	291,040
	18	291,041
	27	291,042
	28	291,043
	70	291,044
	137	291,045
		291,046
	334	291,047
	351	291,048
D8—	1	291,049
	18	291,050
	40	291,051
		291,052
	310	291,053
	325	291,054
	354	291,055
		291,056
		291,057
	356	291,058
	375	291,059
	396	291,061
D9—	389	291,060
	390	291,062
	401	291,063
	415	291,064
	418	291,065
		291,066
		291,067
D10—	30	291,068
	40	291,069
	46.1	291,070
	78	291,071
D11—	118	291,072
D12—	146	291,073
	156	291,074
	169	291,075
	181	291,076
	203	291,077
D14—	12	291,078
	30	291,079
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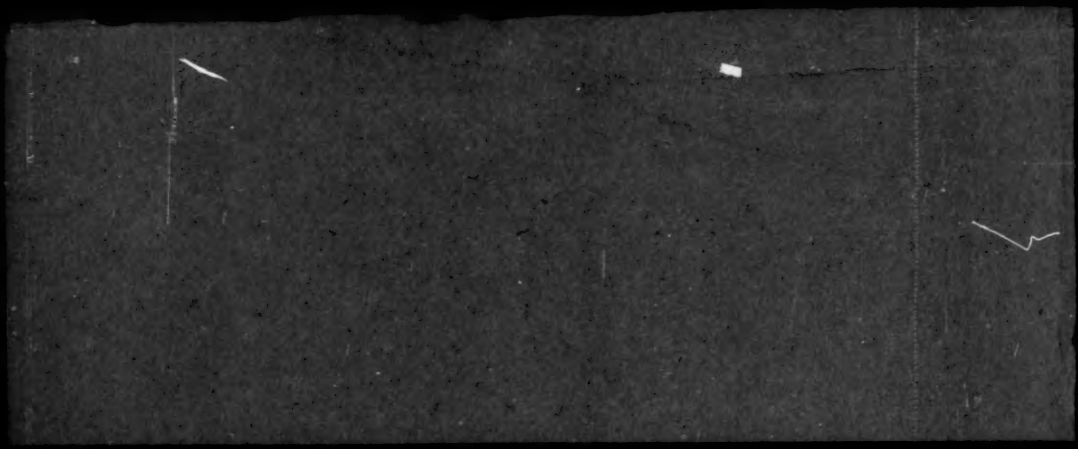
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